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August, 2012

To our first year and transfer students,

Welcome to Rolla and to the Biological Sciences Department of S&T. We’re delighted to have you as members of our academic community, and we want to help you get the most out of your undergraduate years.

This is a very exciting time in biology. The Genomic Era is rapidly maturing. While we now recognize that the human genome is comprised of perhaps 25,000 genes, we only know what less than half of the expressed proteins actually do. Yet we can isolate, clone, mutate, eliminate, and express any of them at will. Clearly, there is an awful lot of work to be done, and plenty of room for you to leave your mark.

The Biological Sciences Department at Rolla has a strong emphasis in molecular and cellular approaches to biological problems. Areas of particular interest include cell biology, bioinformatics, plant genomics, microbiology, biomaterials, toxicology and ecology.

Biological Sciences at S&T is growing and improving. While each faculty member is intensely involved in research, the faculty is collectively and individually committed to undergraduate education. Our program features small classes, extensive interaction with faculty, and student participation in research (not to be confused with laboratory learning exercises). Many of the best teachers on campus are in our department.

As you will soon realize, the Survival Guide is not actually a survival guide; it is a guide for flourishing during your undergraduate years at S&T. In these pages, we answer some of the questions most frequently asked by students new to our campus. This information comes from departmental publications and the undergraduate catalog, as well as collective BioSci folklore. We hope you will find it useful.

We’re excited about our work, and want to share this excitement with you. We are glad you are here.

Again, welcome,
Robert S. Aronstam, Ph.D.
Professor and Chair, Biological Sciences
Department Profile

Why study Biology at S&T?
You will be a full participant in the biology academic community at S&T. Our undergraduates are students, researchers, writers, organizers and leaders.

S&T Biological Sciences offers:
- A comprehensive curriculum (diverse electives; extensive laboratory and field work)
- Abundant opportunities for student research
- Award-winning teachers
- Collegial student-faculty interactions and collaborations
- An excellent placement record to graduate and professional schools
- Small class sizes and a low student: faculty ratio
- Internationally recognized research programs

Mission Statement – Biological Sciences
To promote learning and discovery in the biological sciences while functioning as an inclusive academic community that is supportive, collegial, challenging and rewarding, and that values the personal and professional development of all its members (students, faculty, and staff).
Specific goals:
- Fostering the biology education of all students (majors and non-majors), and increasing the general public’s awareness of contemporary issues related to biology;
- Facilitating students’ mastery of biological knowledge, engaging them in the process of scientific discovery, and developing their ability to think critically and communicate effectively; and
- Conducting and communicating the results of innovative biological research

The Biological Sciences program seeks to fulfill these education missions by providing a strong, contemporary undergraduate curriculum that serves the needs of Biology majors wishing to prepare for careers in this basic science and health professions as well as the needs of non-majors including engineering students interested in specialized biotechnology courses and liberal arts majors requiring introductory science courses. The Biological Sciences Department has a number of interdisciplinary research activities in progress. With the rapidly developing interface between engineering and biology across the nation, the Biology Program on the S&T campus is in an enviable position for participating in the leadership of this development.

History
The S&T Biological Sciences Department (formerly Life Sciences) was established as an autonomous department within the College of Arts and Sciences in 1978. The department has ten Ph.D faculty members and currently has over 200 undergraduate majors and 7 graduate students. The department offers Bachelor of Science, Bachelor of Arts and Master of Science degrees with emphasis areas in pre-medicine and teacher certification and a minor in bioinformatics. Students in other degree programs can also choose to minor in biological sciences or bioinformatics.
Robert S. Aronstam, Ph.D.

Professor Chair, Department of Biological Sciences

Director, S&T cDNA Resource Center
Director, Laboratory of Neurobiology

Research Interests:
Neurochemical, physiological, pharmacological and toxicological characterization of muscarinic acetylcholine receptors
Synaptic signal transduction; IP3, cAMP, Ca2+ mediated responses and interactions
Effects of oxidative stress on muscarinic signaling pathways

Education:
Columbia College of Columbia University, New York, B.A., 1972
University of Rochester, Rochester, New York, Ph.D., Neuroscience, 1978

Representative Publications:
Huang, C.-C., R.S. Aronstam, D.-R. Chen and Y.-W. Huang, Oxidative stress, calcium homeostasis and altered gene expression in human lung epithelial cells exposed to ZnO nanoparticles, Toxicology In Vitro 24:45-55, 2009; doi:10.1016/j.tiv.2009.09.007

Courses: Cell Biology (BIO 211), Neurobiology (BIO 382), Pharmacology (BIO 383)

Websites: sites.google.com/a/mst.edu/aronstam/
www.cdna.org

Roger F. Brown, Ph.D.

Professor
Director, S&T Animal Research Facility
Director, Biomaterials Laboratory

Research Interests:
Biomaterials for bone repair and therapeutic applications
Development of bioactive glass coatings on titanium implants for enhanced bonding at implant site
Porous bioactive glass scaffolds for in vitro engineering of new bone tissue
Bioabsorbable composite materials for bone fracture fixation
Neutron-activatable glass microspheres for radiotherapeutic applications

Education:
Colorado State University, Ft. Collins, B.S. Zoology, 1964
Colorado State University, Ft. Collins, Ph.D., Physiology, 1968
University of Pittsburgh School of Medicine, Pittsburgh, Postdoctoral training, 1968-71

Representative Publications:

Courses Taught:
Human Anatomy (BIO 241), Human Physiology Lecture (BIO 242) and Lab (BIO 243), Biomaterials (BIO 340), Tissue Engineering (BIO 401)

Website: http://web.mst.edu/~rbrown
Ronald L. Frank, Ph.D.
Associate Professor
Laboratory of Plant Molecular Genetics

Research Interests:
Identification of gene families using computer algorithms
Evolution and expression of gene families in plants
Structure and expression of phenylalanine ammonia lyase genes in soybean

Education:
Houghton College, Houghton, New York, B.S. in Biology, 1978
Ohio State University, Columbus, M.S. in Genetics, 1981
Ohio State University, Columbus, Ph.D. in Genetics, 1985

Representative Publications:


Representative Publications:


Courses Taught:
- General Genetics (BIO 231), Evolution (BIO 235), Molecular Genetics (BIO 331)

Website: http://web.mst.edu/~rfrank

Chen Hou, Ph.D.
Assistant Professor
Director, Laboratory of Animal Physiology

Research Interests
Metabolic basis of aging
Energetic basis of animal growth and reproduction
Mammalian respiratory physiology
Eusocial insects

Education
Sichuan University, Chengdu, China, B.S. in Physics, 1997
University of Missouri, Columbia, MO, M.S. in Physics, 2000
University of Missouri, Columbia, MO, Ph.D. in Physics 2005

Representative Publications


Courses Taught:
- General Genetics (BIO 231), Evolution (BIO 235)

Website: http://www.mst.edu/~houch
Yue-wern Huang, Ph.D.
Associate Professor
Director, Laboratory of Environmental Toxicology

Research Interests:
Manipulate semiconductor nanocrystals (a.k.a., quantum dots, QDs) and cell penetrating peptides (CPPs) to deliver biologically active molecules in vitro and in vivo for basic science research and biomedical applications relevant to disease treatment
Discover physical and chemical properties of nanomaterials that govern molecular mechanisms of toxicity; utilizing inhalation chambers to elucidate mechanisms of toxicity
Environmental pollution and public health

Education:
National Taiwan Normal University, B.A., 1985
National Taiwan Normal University, M.S. 1988
University of Wisconsin-Madison, Ph.D., 1998

Representative Publications:
2010. Chuan-Chin Huang, Yi Xu, Paul Nam, Jeff Briggler, Mike McKee, and Yue-wern Huang. Heavy metals, hematology, and serum chemistry in adult hellbenders (Cryptobranchus alleganiensis). Environmental Toxicology and Chemistry 29:1132-1137. DOI:10.1002/etc.148.

Courses Taught:
Ecology (BIO 251), Toxicology (BIO 370/470), Techniques in Applied and Environmental (BIO 475)

Website: http://www.mst.edu/~huangy
Dev K. Niyogi, Ph.D.
Professor
Laboratory of Environmental Microbiology

Research Interests:
- Anaerobic microorganisms
- Bioenergy Production
- Extremophiles in saline environments

Education:
- University of Cincinnati, Cincinnati, B.S., 1985
- University of Louisville, Louisville, M.S., 1988
- University of Oklahoma, Norman, Ph.D., 1995

Recent Publications:

- VanEngelen, M.R., B.M. Peyton, **M.R. Mormile,** and H.C. Pinkart. 2008 Fe(III), Cr(VI), and Fe(III) mediated Cr(VI) reduction in alkaline media using a Halomonas isolate from Soap Lake, Washington. Biodegradation 19:841-850 2008

Research Interests:
- Nutrient uptake in streams and other aquatic systems
- Role of biodiversity in controlling ecosystem processes
- Effects of humanity on stream ecosystems

Recent Publications:


Courses Taught:
- Introduction to Biological Sciences (BIO 102)
- Microbiology (BIO 221)
- Environmental Microbiology Lab (Bio 301)
- Advanced Microbial Metabolism (BIO 421)
- Astrobiology (Bio 452)
- Bioremediation (BIO 455)
- Environmental Microbiology (BIO 451)
- Astrobio (BIO 452)

Websites: [http://www.mst.edu/~mmormile](http://www.mst.edu/~mmormile) and [www.editcorp.com/LIEE](http://www.editcorp.com/LIEE)

Dev K. Niyogi, Ph.D.
Associate Professor
Director, Laboratory of Freshwater Ecology

Research Interests:
- Effects of humanity on stream ecosystems
- Role of biodiversity in controlling ecosystem processes
- Nutrient uptake in streams and other aquatic systems

Education:
- Swarthmore College, Swarthmore, Pennsylvania, B.A, 1989
- University of Colorado, Boulder, Ph.D., 1999

Recent Publications:


Courses Taught: Biodiversity (BIO 113), Introduction to Environmental Science (BIO 151), Field Ecology (BIO 201), Ecology (BIO 251), Freshwater Ecology (BIO 354), Global Ecology (BIO 364)
Katie B. Shannon, Ph.D.
Assistant Professor
Director: Laboratory of Cytokinesis

Research Interests:
The temporal and spatial control of cell division
Budding yeast as a model to determine how cytokinesis is cell-cycle regulated.

Education:
University of North Carolina-Chapel Hill, B.A., 1994
Harvard Medical School, Boston, MA , Ph.D., Cell and Developmental Biology, 2000

Representative Publications:

Courses Taught:
Cell Biology (BIO 211), Cancer Biology (BIO 335/435), Developmental Biology (BIO 315), Senior Seminar (BIO 310)
Website: http://www.mst.edu/~shannonk http://openwetware.org/wiki/User:Katie_B_Shannon

Matthew S. Thimgan, Ph.D.
Assistant Professor
Director: Laboratory of Genetic & Behavioral Sleep Research

Research Interests:
Genes and metabolic pathways that regulate both the sleep and wake cycles
Pathways that mitigate the negative consequences of sleep deprivation, with a focus on lipid metabolism pathways
Salivary biomarkers of sleep deprivation

Education:
University of Los Angeles, B.S., 1994
University of North Carolina, Chapel Hill, Ph.D., Cell and Molecular Physiology, 2005

Representative Publications

Courses Taught
Bio244 Anatomy & Physiology
David J. Westenberg, Ph.D.
Associate Professor
Chair, Pre-Medicine Advisory Committee

Research Interests:
- Cell-cell interactions in the *Bradyrhizobium japonicum*/Soybean symbiosis
- Bioenergetics of symbiotic nitrogen fixation
- Regulation of bacterial gene expression in response to iron, heme and oxygen
- Rhizosphere microbiology

Education:
- Michigan State University, East Lansing, B.S. Microbiology and Public Health, 1982
- University of California, Los Angeles, Ph.D. Microbiology and Molecular Genetics, 1991

Representative Publications:

D.J. Westenberg, 2007 *B. japonicum*, Agriculture and the Bacterium, BIOforum Europe, 11:16


D.J. Westenberg and M. L. Guerinot, 1999, Succinate dehydrogenase (Sdh) from *Bradyrhizobium japonicum* is closely related to mitochondrial Sdh and is sensitive to the agricultural fungicide carboxin, J. Bacteriol.181:4676-4679


Courses Taught:
- Microbiology (BIO 221) and Microbiology Lab (BIO 222), General Genetics (BIO 231), Senior Seminar (BIO 310), Pathogenic Microbiology (BIO 321), General Virology (BIO 391), Advanced Microbial Metabolism (BIO 421)

Website: [http://www.mst.edu/~djwesten](http://www.mst.edu/~djwesten)

Terry J. Wilson, MS
Associate Teaching Professor

Research Interests:
- Funded NIH research project, “Immunity in Children With Exposure To Environmental Lead”

Education:
- Southwest Missouri State University, Springfield, B.S. in Education, 1983
- Southwest Missouri State University, Springfield, M.S. in Biology, 1993

Courses Taught:
- General Biology Lecture (BIO 110) and Lab (BIO 112), Principles of Biology (BIO 111) Cell Biology Lab (BIO 212), Biodiversity Lecture (BIO 113) and Lab (BIO 114)

Website: [http://www.mst.edu/~twilson](http://www.mst.edu/~twilson)
<table>
<thead>
<tr>
<th>Name</th>
<th>Office</th>
<th>Phone</th>
<th>Lab</th>
<th>Phone</th>
<th>E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>BioSci Office</td>
<td>105</td>
<td>4831</td>
<td></td>
<td>4821 (FAX)</td>
<td><a href="mailto:biosci@mst.edu">biosci@mst.edu</a></td>
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<tr>
<td>Dr. Robert Aronstam</td>
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<td>4819</td>
<td>206</td>
<td>7610</td>
<td><a href="mailto:aronstam@mst.edu">aronstam@mst.edu</a></td>
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<tr>
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<td></td>
<td></td>
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<tr>
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<td>G13C</td>
<td>4860</td>
<td>G13</td>
<td>4814</td>
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<tr>
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<td>203 E</td>
<td>4861</td>
<td>203 F Centennial Hall</td>
<td>4861</td>
<td><a href="mailto:rfrank@mst.edu">rfrank@mst.edu</a></td>
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<td>Dr. Chen Hou</td>
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<tr>
<td>Dr. Yue-Wern Huang</td>
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<td>127</td>
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</tr>
<tr>
<td>Adam Martin</td>
<td>206</td>
<td>6988</td>
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<tr>
<td>Dr. Melanie Mormile</td>
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<td>6346</td>
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<td>6807</td>
<td><a href="mailto:mmormile@mst.edu">mmormile@mst.edu</a></td>
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<tr>
<td>Dr. Dev Niyogi</td>
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<td>7191</td>
<td>211</td>
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<td>Jessica Pelc</td>
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<tr>
<td>Dr. Matt Thimgan</td>
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<td>7190</td>
<td>110D</td>
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<tr>
<td>Dr. Katie Shannon</td>
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<td>6336</td>
<td>102/113</td>
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<tr>
<td>Dr. Dave Westenberg</td>
<td>202</td>
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<td>203</td>
<td></td>
<td><a href="mailto:djwesten@mst.edu">djwesten@mst.edu</a></td>
</tr>
<tr>
<td>Ms. Terry Wilson, MS</td>
<td>111a</td>
<td>6121</td>
<td>111</td>
<td></td>
<td><a href="mailto:twilson@mst.edu">twilson@mst.edu</a></td>
</tr>
</tbody>
</table>
Biological Sciences or Biology is the study of life and living organisms, and it embraces a vast and rapidly expanding body of knowledge, including:

- Biochemistry, cellular and molecular biology
- Anatomy and physiology of cells, tissues, organs and organ systems, and whole organisms
- Structure, function, and behavior of individuals, populations, communities, ecosystems, and the entire biosphere

Biology draws on the physical sciences (chemistry, physics, mathematics, and earth sciences) as well as the behavioral sciences for the analysis and interpretation of life’s varied processes and interrelationships.

The study of biological sciences provides the academic foundation for careers and advanced study and research in:

- Industry and government (chemical, food, agriculture, pharmaceutical, environmental, research)
- Education (teaching and graduate study)
- Human and Veterinary medicine, dentistry, nursing, pharmacy, and other health professions

The core curriculum for Biological Sciences majors consists of course work in introductory biology, biodiversity, cellular biology, microbiology, genetics, and ecology. Advanced courses offer greater depth, detail and specific information leading to proficiency and preparation for employment and other postgraduate activities.

Faculty members active in research teach all Biological Sciences courses. Classes are small, providing exceptional opportunity for discussion and individual attention. Most students participate in research projects, learning techniques and skills that will prepare them for postgraduate opportunities. Additional training in mathematics and physical sciences, together with course work in the humanities and social sciences, provides a well-rounded educational experience.

Undergraduate Research

Your undergraduate educational experience can be greatly enhanced by participating in undergraduate research. Hands-on experience can be invaluable when seeking a job or graduate school after completing your bachelor’s degree. Missouri S&T’s Biological Sciences Department has a strong reputation for close collaboration between faculty and undergraduate students and a long history of integrating education and research thanks to our low faculty-to-student ratio.

BioSci Web Site
biosci.mst.edu

Career Opportunities

Missouri S&T students who have received their Bachelor of Science degrees in Biological Sciences have an excellent record of success, evidenced by their performance on national achievement examinations. A broad range of training offered, provides Missouri S&T graduates with excellent preparation for a wide variety of jobs and graduate study programs. The results of this training can be seen in the exceptionally high number of S&T students accepted into professional schools of medicine, dentistry, and pharmacy.

Entry Level Job Titles

- Research Assistant
- Teacher
- Environmental Consultant
- Research Scientist
- Laboratory Assistant

Scholarships

Departmental Scholarships include:

- Heilbrunn Scholarship for entering freshman
- Alumni Scholarships for sophomores, juniors and seniors
- Gale-Hufham Scholarship for outstanding upperclassmen
- Summers Pre-Med scholarships

Faculty

Professors:
Robert Aronstam, Ph.D., (Chair), Univ. of Rochester
Roger Brown, Ph.D., Colorado State
Melanie Mormile, Ph.D., Oklahoma
Yue-Wern Huang, Ph.D., Wisconsin-Madison

Associate Professor:
Ronald L. Frank, Ph.D., Ohio State
Yue-Wern Huang, Ph.D., Wisconsin-Madison
Dev Niyogi, Ph.D., Colorado
David Westenberg, Ph.D., UCLA

Assistant Professors:
Chen Hou, Ph.D., University of Missouri, Columbia,
Katie Shannon, Ph.D., Harvard
Matt Thimgan ,Ph.D.,UNC

Lecturers:
Terry Wilson, M.S., Southwest Missouri State
Adam Martin, M.S., Missouri S&T

Application Information

Admissions Office
106 Parker Hall
300 W. 13th St.
Rolla, MO, 65409
(573) 341-4165
Fax: (573) 341-4082
admissions@mst.edu
B.S. In Biological Sciences: Degree Requirements
The Bachelor of Science degree in Biological Sciences requires 130 semester hours of credit, including 46 semester hours of Biological Sciences course work.

Biological Sciences Courses
Introduction to Biological Sciences (Bio 102).................1
Principles of Biology (Bio 111 and 112).........................5
Biodiversity (Bio 113 and 114).................................4
Cellular Biology (Bio 211 and 212)...............................4
Evolution (Bio 235)..............................................3
General Genetics (Bio 231)......................................3
Ecology (Bio 251)................................................3
Seminar (Bio 310).................................................1
Advanced biological sciences or approved advanced course work in other science or engineering disciplines......22
Chemistry, 20 semester hours of chemistry, including:
Chem 1, 2, 3, and 4........................................9
Organic Chemistry (Chem 221, 226, 223, 228).....................10
General Biochemistry (Chem 361)...............................3
Physics, 2 semesters (Physics 21/31, 22, 25/35, and 26)........10/8
Mathematics through Math 8/14..................................variable
Humanities, excluding foreign language, and to include:
English 20 and English 60.......................................12
Social Sciences ......................................................9
Elective credits: In consultation with his or her advisor, each student will select sufficient additional courses to complete a minimum of 130 credit hours. A minimum grade of "C" is required for each Biological Science course to fulfill the B.S. degree requirements.

B.A. In Biological Sciences: Degree Requirements
The Bachelor of Arts degree in Biological Sciences requires 120 semester hours of credit, including 30 semester hours of Biological Sciences course work.

Biological Sciences Courses
Introduction to Biological Sciences (Bio 102).................1
Principles of Biology (Bio 111 and 112).........................5
Biodiversity (Bio 113 and 114).................................4
Cellular Biology (Bio 211 and 212)...............................4
General Genetics (Bio 231)......................................3
Ecology (Bio 251)................................................3
Seminar (Bio 310).................................................1
Advanced biological sciences or approved advanced course work in other science or engineering disciplines......9
Chemistry, 15 semester hours, including:
Chem 1, 2, 3, and 4........................................9
Organic Chemistry (Chem 221, 223).........................8
Mathematics and Physical Science.................................9
(Proficiency in College Algebra must be demonstrated by a grade of "C" or better in a College Algebra course or by examination)
Computer Science or Statistics..................................3
Humanities, excluding foreign language, and to include:
English 20 and English 60 .....................................18
Social sciences, including Hist 110 or 112 and 175 or 176
Pol Sci 90 or equivalent........................................18
Foreign Language..................................................11
Elective credits: In consultation with his or her advisor, each student will select sufficient additional courses to complete a minimum of 120 credit hours.

Emphasis areas: Students may choose emphasis areas in pre-medicine (B.A. only), bioinformatics or teacher certification.

Minors in Biological Science
Students wishing to minor in Biological Sciences must take a minimum of 20 hours of Biological Sciences course work, which must include Bio 111, 112, and 211, 212, and at least seven hours of advanced (200 or 300 level) BioSci to be selected in consultation with a BioSci departmental adviser. Students minoring in Biological Sciences should declare these intentions prior to the junior year.
Biological Sciences Program

Biological sciences or biology is the study of life and living organisms. Biological sciences embraces a vast and rapidly expanding body of knowledge:

- Biochemistry, cellular, and molecular biology
- Anatomy and physiology of cells, tissues, organs and organ systems, and whole organisms
- Structure, function and behavior of individuals, populations, communities, ecosystems and the entire biosphere

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Faculty members active in research teach all biological sciences courses. Classes are small, providing exceptional opportunity for discussion and individual attention. Most students participate in research projects and learn techniques that will prepare them for postgraduate opportunities. Additional training in mathematics and physical sciences, together with course work in the humanities and social sciences, provides a well-rounded educational experience.

Departmental Contact
Dr. Ronald L. Frank
rfrank@mst.edu
573-341-4861

Teacher Education Program

The Missouri S&T teacher education program embraces a structured education strategy integrating classroom studies with learning through productive work experiences in a field related to a student’s academic interests. It provides progressive experiences in integrating theory and practice.

Students interested in teaching Biological Sciences may enter the Teacher Education Program as early as their freshman year. The purpose of the program is to satisfy the continuing need for well-qualified teachers in Missouri schools and across the nation.

A student may earn a Bachelor of Arts degree in biological sciences from Missouri S&T while completing requirements for certification to teach in Missouri schools. Many surrounding states have reciprocal agreements with Missouri with respect to certification requirements. In most other states, students may obtain temporary certification that allows them to teach until the requirements of that particular state are completed. All of the course work required in this program is available on the S&T campus; student teaching and clinical experiences are arranged with the Rolla area public schools within 30 miles of the campus.

To qualify for certification, students must have a minimum ACT score of 22 as well as a 265 C-BASE score in each area (including the composite score), a passing PRAXIS score, and a 2.5 or greater GPA. Each student must also submit a portfolio, complete a background check and fingerprinting, and complete the courses listed on the reverse side of this fact sheet.

A wide variety of university scholarships and loans, as well as departmental scholarships are available for education students.

Contact
Mrs. Lauri Bracken
Senior Secretary
brackenl@mst.edu
573-341-4692

Missouri S&T students may earn a certificate to teach in the secondary schools of Missouri while pursuing a B.A. degree in biological sciences. The Missouri S&T education program promotes a balance between science and professional competence in teaching.

The teaching certification program may be completed in four academic years, although students may elect to attend summer sessions to lighten the load during regular academic semesters. Those students pursuing a Bachelor of Arts degree in biological sciences can take the Praxis Exam to qualify for other endorsement areas aside from the certification in biology.
# Teacher Certification Curriculum with B.A. in Biological Sciences

<table>
<thead>
<tr>
<th>Biological Sciences Courses</th>
<th>27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Biological Sciences (Bio 102)</td>
<td>1</td>
</tr>
<tr>
<td>Principles of Biology (Bio 111 and 112)</td>
<td>5</td>
</tr>
<tr>
<td>Biodiversity (Bio 113 and 114)</td>
<td>4</td>
</tr>
<tr>
<td>Cellular Biology (Bio 211 and 212)</td>
<td>4</td>
</tr>
<tr>
<td>General Genetics (Bio 231)</td>
<td>3</td>
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<tr>
<td>Ecology (Bio 251)</td>
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<tr>
<td>Environmental Science (Bio 151)</td>
<td>3</td>
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<tr>
<td>Seminar (Bio 310)</td>
<td>1</td>
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<tr>
<td>Evolution (Bio 235)</td>
<td>3</td>
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<tr>
<td>Mathematics and Physical Sciences Courses</td>
<td>9</td>
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<tr>
<td>Geology 51</td>
<td>3</td>
</tr>
<tr>
<td>Physics 31</td>
<td>3</td>
</tr>
<tr>
<td>Math 3 or above</td>
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</tr>
<tr>
<td>Chemistry Courses</td>
<td>17</td>
</tr>
<tr>
<td>Statistics or Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>Chem 1 - General Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>Chem 2 - General Chemistry Lab</td>
<td>1</td>
</tr>
<tr>
<td>Chem 3 - General Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>Chem 4 - Introduction to Lab Safety</td>
<td>1</td>
</tr>
<tr>
<td>Chem 221 - Organic Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>Chem 223 - Organic Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>Comp Sci or Stats Courses</td>
<td>3</td>
</tr>
<tr>
<td>Statistics or Computer Science</td>
<td>3</td>
</tr>
</tbody>
</table>

| Humanities Courses                                             | 18 |
| English 20 - Exposition and Argumentation                      | 3  |
| English 60 - Writing and Research                              | 3  |
| Speech 85 - Principles of Speech                               | 3  |
| Art 80, Music 50 or Theatre Appreciation                       | 6  |
| Literature                                                     | 3  |
| Philosophy                                                     | 3  |

| Social Sciences Courses                                         | 15 |
| History 111 - Early Western Civilization                       | 3  |
| History 112 - Modern Western Civilization                      | 3  |
| Hist 275 - History of Science                                  | 3  |
| PolSci 90 - American Government                                 | 3  |

| Professional Requirements                                      | 42 |
| Educ 40 - Perspectives in Education                            | 2  |
| Educ 104 - Teacher Field Experience                            | 2  |
| Educ 164 - Aiding Elementary, Middle and Secondary Schools     | 2  |
| Educ 174 - School Organization and Admin for Elementary and Secondary Teachers | 2  |
| Educ 251 - Historical Found of Amer Educ                       | 3  |
| Educ 216 - Teaching Reading in Content Area                    | 3  |
| Educ 280 - Teaching Methods and Skills in Content Areas        | 6  |
| Educ 298 - Student Teaching Seminar                            | 1  |
| Educ 299 - Student Teaching                                    | 12 |
| Psych 155 - Educational Psychology                             | 3  |
| Psych 208 - Psychological and Educational Development of the Adolescent | 3  |
| Psych 354 - Psychology of the Exceptional Child                | 3  |

**Total: 131 Hours**

**Title II Report - 2003-2004**

The federal government required Title II report for the year 2003-2004 were submitted in April 2004. The University of Missouri-Rolla has a 100 percent passing rate on the PRAXIS for our completers. (The state percentage was 98 percent.) A completer is one who has fulfilled all institutional guidelines for recommendation to the state for his/her teaching certificate. One hundred percent of the Missouri S&T completers are teaching; 75 percent of these are teaching in Missouri.
Students from Missouri S&T have had great success in admissions to health profession programs including human (DO and MD) and veterinary medicine, dentistry, pharmacy, physical therapy, nursing, chiropractic and many others.

Students from any academic discipline may participate in the Pre-Health Professions Program at Missouri S&T, though many choose to study Biology or Biochemistry. S&T's Pre-Medical Advisory Committee, consisting of faculty from a number of academic departments, helps students meet the requirements for professional school admission. While the specific requirements for each health profession program varies, most programs have similar basic requirements.

The requirements are:

- Bachelor of Arts or Bachelor of Science degree including:
  - One year of general chemistry (with labs)
  - One year of organic chemistry (with labs)
  - At least one year of biology with labs (some schools require two years)
  - One year of physics (with labs)
  - Algebra and trigonometry (some schools require one year of calculus)
  - A solid background in humanities and social sciences with emphasis on oral and written communication skills
  - Evidence of ability and desire to work with people AND work experience in a hospital or clinical setting

A particular school may have a slight variation on these requirements. Pre-Health students should ask the Pre-Medical Advisory Committee for help in determining exact requirements.

Students can fulfill the requirements for professional school admission within the structure of the following degree programs:

- Biological Sciences
- Biochemical Engineering
- Biochemistry (an emphasis area in Chemistry)

Pre-Health & Pre-Med students desiring to major in other programs at S&T may use elective hours for requirements, such as Organic Chemistry and Biology courses, not covered in those programs.

After completing basic requirements, Pre-Health profession students take the required admission test for their profession of interest: MCAT (Medical College Admission Test) for human or veterinary medicine, DAT (Dental Admission Test), PCAT (Pharmacy College Admission Test), OAT (Optometry Admission Test) GRE (Graduate Record Exam) usually during their junior year. These entrance exams may be repeated.

The student interested in human medicine or dentistry then schedules an interview with the Pre-Medical Advisory Committee. This committee evaluates the student’s credentials, offers helpful suggestions, and prepares a group recommendation that will be sent to all medical schools to which the student plans to apply.

The Department of Biological Sciences sponsors Scrubs, an organization open to Pre-Health Profession students on the campus. Scrubs maintains a small library of MCAT, DAT and PCAT preparation materials and organizes recurring MCAT study groups.

The Pre-Med Advisory Committee works with the Area Health Education Center (AHEC, a state funded agency), as well as local physicians, dentists and veterinarians (often S&T alumni), to arrange shadowing and volunteer experiences with area health providers.

For further information, contact representatives from the Pre-Medical Advisory Committee.

Dr. David Westenberg
djwesten@mst.edu 573-341-4798

Dr. Ron Frank
rfrank@mst.edu 573-341-4861

To access helpful information about the professional school application process, please visit the Pre-Medical web page: http://biosci.mst.edu/pre-professionalprograms/pre-med/

**Application Information**

Admissions Office
106 Parker Hall
300 W. 13th St.
Rolla, MO, 65409
(573) 341-4165
(800) 522-0938
Fax: (573) 341-4082
admissions@mst.edu

**BioSci Web Site**
biosci.mst.edu

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**S&T Miner Pre-Med Web Site**
http://biosci.mst.edu/pre-professionalprograms/pre-med.html
The Department of Biological Sciences offers an interdisciplinary MS Degree in Applied and Environmental Biology. The program emphasizes understanding environmental responses and adaptations in biological systems at the cellular and molecular levels.

An understanding of the environment and associated problems requires background knowledge and applications of modern technology derived from many traditional fields of science, mathematics, and engineering. Students who participate in the Applied and Environmental Biology MS Degree program are given opportunities for performing research critical for gaining this understanding.

The unique focus on engineering and the sciences at S&T offers opportunity for integrated course work and collaborative research dealing with the complexities of environmental biology. Students requiring analytical instruments have access to resources in the following centers on the Missouri S&T campus: Environmental Research Center, Center for Environmental Science and Technology (CEST), and Graduate Center for Materials Research.

Equipment required for graduate laboratory experiences in the biological sciences is available within the department or in the laboratories of collaborators in the other disciplines. The Department of Biological Sciences is well equipped with state-of-the-art equipment for cell and molecular biology. This equipment includes: Centrifuges: high speed, ultra-, micro-, preparative, and evaporative Laminar flow hoods; cell culture incubators, PCR thermocyclers, Electroporator, Protein and DNA gel-electrophoresis units, Semi-dry and submarine nucleic acid/protein transfer units, Growth chambers, Shaking incubators, Automated capillary-based DNA sequencer/analyzer, UV-Trans-illuminator and gel documentation system, Research microscopes, Nanopure water purification system, UV-Vis spectrophotometers, Scintillation counters, Microtiter plate reader, Semi-automatic cell-harvester, Media prep room with autoclaves.

Departmental research efforts are distinguished by their association with other science and engineering disciplines on the Missouri S&T campus through collaborations with the following departments:
- Ceramic Engineering
- Chemical Engineering
- Chemistry
- Civil Engineering
- Computer Science
- Computer and Electrical Engineering
- Environmental Engineering
- Geology and Geophysics
- Mechanical Engineering
- Metallurgical Engineering

Faculty and students also have access to a DNA core facility within the University of Missouri system. Campus-wide Computer Learning Centers (CLC’s) provide access to software necessary for molecular biology applications. Equipment for environmental microbiology includes a Coy anaerobic chamber. Faculty and students requiring vertebrate animals for research have access to the S&T Animal Research Facility, a resource facility for the S&T campus. This space includes colony rooms, a room for sterile surgery, a cage-washing room, and other support rooms. The facility complies with all applicable PHS and USDA guidelines pertaining to facilities for maintenance of vertebrate animals for research.

**Faculty Professors:**
- Robert S. Aronstam (Chair), Ph.D., Rochester
- Roger Brown, Ph.D., Colorado State
- Melanie Mormile, Ph.D., Oklahoma
- Yue-Wern Huang, Ph.D., Wisconsin-Madison

**Associate Professors:**
- Ronald L. Frank, Ph.D., Ohio State
- Dev Niyogi, Ph.D., Colorado
- David Westenberg, Ph.D., UCLA

**Assistant Professors:**
- Chen Hou, Ph.D., University of Missouri, Columbia
- Katie Shannon, Ph.D., Harvard
- Matt Thimgan, Ph.D., UNC

**Lecturers:**
- Terry Wilson, M.S., Southwest Missouri State
- Adam Martin, M.S., Missouri S&T

**Application Information**
Admissions Office
106 Parker Hall
300 W. 13th St.
Rolla, MO, 65409
(573) 341-4165
Fax: (573) 341-4082
admissions@mst.edu

**BioSci Web Site:**
biosci.mst.edu
Degree Requirements - With Thesis

Specific requirements for the Master of Science Degree with Thesis in Applied and Environmental Biology include a minimum of 30 semester hours of credit, which must include 24 hours of biological sciences course work to include:

Biological Sciences Courses
- BioSc 402 Problems in Applied and Environmental Biology .................................................. 2
- BioSc 410 Graduate Seminar ................................................. 1
- BioSc 475 Techniques in Modern Biology ...................... 3
- BioSc 490 Graduate Research ...(Minimum hrs) .... 6

Out-of-department courses ................................................. 6

Elective credits: In consultation with his or her advisor, each student will elect sufficient additional courses to complete a minimum of 30 credit hours. Up to six credit hours can be taken from 200-level courses offered by other departments. A minimum grade of B is required for each Biological Science course used to fulfill the M.S. degree requirements.

Candidates for the Master's Degree with Thesis will conduct original research, write a thesis on the research conducted, and provide a satisfactory defense of the thesis in a final oral examination.

Degree Requirements - Without Thesis

Specific requirements for the Master of Science Degree without Thesis in Applied and Environmental Biology include a minimum of 30 semester hours of credit, which must include 27 hours of biological sciences course work to include:

Biological Sciences Courses
- BioSc 402 Problems in Applied and Environmental Biology .................................................. 2
- BioSc 410 Graduate Seminar ................................................. 1
- BioSc 475 Techniques in Modern Biology ...................... 3

Out-of-department courses ................................................. 6

Elective credits: In consultation with his or her advisor, each student will elect sufficient additional courses to complete a minimum of 30 credit hours. Up to six credit hours can be taken from 200-level courses offered by other departments. A minimum grade of B is required for each Biological Science course to fulfill the M.S. degree requirements.
**Student Organizations**

**Helix**

Helix is the Biological Sciences service/recreational organization. Our mission is to promote an appreciation and understanding of the biological sciences, and to foster strong academic, social, and campus leadership.

Regular membership is open to all S&T students not on scholastic probation at the time of joining. This includes Biological Sciences majors, minors, and anybody who just likes having fun helping others.

Associate membership is open to members of the S&T faculty who have an interest in the biological sciences and the organization HELIX. Associate members have all rights and privileges of the organization except for the right to hold office.

If you have any questions about HELIX, please contact Dr. Mormile or visit our web page: [http://campus.mst.edu/~helix/](http://campus.mst.edu/~helix/)

**Phi Sigma**

Phi Sigma is a biology honorary society open to juniors and seniors with interest in the biological sciences and a comparable academic record that shows their devotion to the subject. Invitations to join go out at the beginning of the spring semester.

If you have any questions about Phi Sigma, please contact Dr. Frank or visit our web page: [http://campus.mst.edu/~phisigma/](http://campus.mst.edu/~phisigma/)

**Scrubs**

Scrubs is open to students from any degree program interested in health care related careers. The goals of Scrubs are: 1) to promote an appreciation and understanding of all health related scientific fields; 2) to foster strong academic, social, and campus leadership; 3) to promote scientific knowledge and intellectual curiosity through personal associations and exchange of ideas; 4) to promote communications among students interested in medicine, dentistry, pharmacy, veterinary science and physical therapy; 5) to promote awareness of career opportunities available in the fields of medicine, dentistry, pharmacy, veterinary science and physical therapy; and 6) to foster awareness and understanding of the process of applying to and preparing for a position in the fields listed above.

If you have any questions about Scrubs, please contact Dr. Westenberg or visit our web page: [http://campus.mst.edu/~scrubs/](http://campus.mst.edu/~scrubs/)

**iGEM**

International Genetically Modified Machines (iGEM) is an interdisciplinary team of students working to design and construct genetically engineered microorganisms. The team competes in the annual iGEM synthetic biology competition at MIT each fall. The team is currently working on a project to convert *E. coli* for cell surface enzyme anchoring.


If you are interested in joining iGEM, contact one of the iGEM faculty advisors – Dr. Katie Shannon (shannonk@mst.edu), Dr. Dave Westenberg (djwesten@mst.edu)
Degree Requirements for B.S. in Biological Sciences

Anyone receiving the B.S. degree in Biological Sciences from Missouri S&T must complete the following academic requirements:

**HUMANITIES**  
12 Semester Hours  
Must include: English 20 Exposition and Argumentation (3 Hours), English 60 Writing and Research or 160 Technical Writing (3 Hours) Humanities include: English, Speech, Drama, Art Appreciation, Music Appreciation, Philosophy, Logic, and Literature, excluding foreign language and studio courses.

**SOCIAL SCIENCES:**  
9 Semester Hours  
Must include either History 112, 175, 176, or Political Science 90. Social Sciences include: History, Political Science, Sociology, Psychology, Economics, and Anthropology.

**MATHEMATICS:**  
2 Semesters  
Must include one semester of Calculus.

**PHYSICS:**  
2 Semesters  
2 Semesters of Physics with lab (Physics 21/31, 22, 25/35 & 26)

**CHEMISTRY:**  
21 Semester Hours  
Must include General Chemistry courses 1, 2, 3, and 4, two semesters of Organic Chemistry Lecture 221, 223, and Labs 226 and 228 and Biochemistry 361

**BIOLOGICAL SCIENCES:**  
46 Semester Hours  
The following “Core Coursework in Biological Sciences” is required of all BS majors:  
- BIO 102: Freshman Seminar, Introduction to Biological Sciences (1 hour)  
- BIO 111: Principles of Biology (3 hours)  
- BIO 112: General Biology Lab (2 hours)  
- BIO 113: Biodiversity (3 hours)  
- BIO 114: Biodiversity Lab (1 hour)  
- BIO 211: Cellular Biology (3 hours)  
- BIO 212: Cell Bio Lab (1 hour)  
- BIO 235: Evolution (3 hours)  
- BIO 231: Genetics (3 hours)  
- BIO 251: Ecology (3 hours)  
- BIO 310: Senior Seminar (1 hour)  

22 Semester hours of advanced elective coursework including at least one advanced lab (200 level or above—see page 30)

**ELECTIVES:**  
Sufficient elective coursework to provide MINIMUM of 130 Semester Hours required for graduation.

**Advanced Placement in Biology:**  
Students who score a “4” on the Advanced Placement Biology Exam will receive three credit hours for Bio 110/111. A score of “5” on the same exam will earn the student five credit hours for Bio 110/111 and 112 General Biology Laboratory.

**MFAT:**  
All graduating students are required to take the Major Fields Achievement Test (MFAT) as their Senior Assessment and are responsible for signing up to take it. The MFAT is offered twice during each Semester; the dates will be posted outside the Biology Department office.
Planning Your First Semester Classes

The exact course load you take will depend upon various personal decisions and the agreement reached through discussions with your advisor. You realize, of course, that in order to graduate with a minimum of 130 semester hours of credit in a 4 year (8 semester) period, you must take an average of 16.25 credit hours per semester. Full-time students normally carry between 12 and 18 semester hours of credit each semester. You can, if you wish, enroll for fewer hours. It is inadvisable to enroll for more than 18 credit hours in any given semester. Remember: For every hour you are in class, you should expect to spend 2 to 3 hours outside of class in preparation (reading assignments, working problems, reviewing notes, studying, memorizing essentials, etc.). It is up to you to establish an appropriate course load and satisfactory scheduling of your time to permit CLASS ATTENDANCE and STUDY TIME.

The following courses are recommended for your consideration as you arrange classes for your first semester. You and your advisor should choose an appropriate number of these courses, based upon the results of entrance exams and your personal situation.

BIO. 102 (1.0 Semester Hour): Introduction to Biological Science (Freshman Seminar)
Strongly suggested for all First-time Freshmen

BIO. 111 (3.0 Semester Hours): Principles of Biology Lecture
Strongly suggested for all First-time Freshmen

BIO. 112 (2.0 Semester Hours): Introductory Biology Lab
Strongly Suggested for all First-time Freshmen

English 20 (3.0 Semester Hours): Rhetoric and Composition. Depending upon your student number, this course will be available to you in either the Fall Semester or Spring Semester of your freshman year. See your advisor.

Math (Variable Credit): Depending upon the results of your Math Placement Exam
Math 6 (2.0 Semester Hours): Trigonometry. Meets Daily for the last 7 weeks of semester.
Math 8/14 (5.0/4.0 Semester Hours): Calculus I. Meets Daily for the entire semester.
Math 4 and 6 may be taken together. The first 9 weeks will cover algebra only. If performance on final exam is satisfactory, you will automatically continue with Trigonometry. If performance is below acceptable level, you will be automatically transferred to Math 2 to complete the semester of algebra.

Chemistry 1 (4.0 Semester Hours): Introductory Chemistry Lecture. It is not advised to take Chem 1 if you must take Math 2. Caution is also advised if you must take Math 4. Chemistry AS-SUMES a working knowledge of algebra and metric units from the very beginning.

Chemistry 2 (1.0 Semester Hour): Introductory Chemistry Lab. Corequisite or prerequisite enrollment in Chem. I Lecture.

Chemistry 4 (1.0 Semester Hour): Lab Safety and Hazardous Materials Handling. Meets daily for first 3 weeks of semester. May also be taken week prior to beginning of Fall Semester. Required of all students enrolling in Chemistry Lab Courses.

Elective Coursework in Humanities and Social Sciences: Depending on individual needs.
History 112 (3.0 Semester Hours): Western Civilization
History 175 (3.0 Semester Hours): U.S. History -- Through Civil War
History 176 (3.0 Semester Hours): U.S. History -- Post Civil War
Political Science 90 (3.0 Semester Hours): American Government
Psychology 50 (3.0 Semester Hours): Introductory Psychology
Philosophy 5 (3.0 Semester Hours): Introductory Philosophy
Philosophy 15 (3.0 Semester Hours): Logic

Other Electives you may wish to consider:
Physical Education, ROTC, Band, Choir, Theater, etc. (Variable Credit)
# B.S. in Biological Sciences (Sample Schedule)

This is one possible class schedule for completion of a B.S. in Biological Sciences. You should plan your personal schedule in consultation with your academic advisor.

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FALL SEMESTER</strong></td>
<td></td>
<td><strong>SPRING SEMESTER</strong></td>
<td></td>
</tr>
<tr>
<td>Intro to Biological Sciences (BIO 102)</td>
<td>1</td>
<td>Biodiversity (BIO 113)</td>
<td>3</td>
</tr>
<tr>
<td>Principles of Biology (BIO 111)</td>
<td>1</td>
<td>Biodiversity Lab (BIO 114)</td>
<td>1</td>
</tr>
<tr>
<td>General Biology Lab (BIO 112)</td>
<td>3</td>
<td>General Chemistry (Chem 3)</td>
<td>3</td>
</tr>
<tr>
<td>General Chemistry (Chem 1 &amp; 2 &amp; 4)</td>
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<td>Exposition and Argumentation (Eng 20)</td>
<td>3</td>
</tr>
<tr>
<td>Math(^a)</td>
<td>6</td>
<td>History 112, 175 or 176 or Pol Sci 90</td>
<td>3</td>
</tr>
<tr>
<td>Free electives to satisfy graduation requirements</td>
<td>5</td>
<td>Free electives to satisfy graduation requirements</td>
<td>3</td>
</tr>
<tr>
<td><strong>YEAR 1</strong></td>
<td>17</td>
<td><strong>YEAR 2</strong></td>
<td>17</td>
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<tr>
<td><strong>FALL SEMESTER</strong></td>
<td></td>
<td><strong>SPRING SEMESTER</strong></td>
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<tr>
<td>200 Level Bio Core Course</td>
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<td>200 Level Bio Core Course</td>
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<tr>
<td>Organic Chemistry I (Chem 221 &amp; 226)</td>
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<td>Organic Chemistry II (Chem 223 &amp; 228)</td>
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<tr>
<td>Writing and Research (Eng 60)</td>
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<td>Advanced Biological Sciences(^b)</td>
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<td>Advanced Biological Sciences(^b)</td>
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<td>Social Sciences elective</td>
<td>3</td>
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<td>Free electives to satisfy graduation requirements</td>
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<td><strong>YEAR 2</strong></td>
<td>17</td>
<td><strong>YEAR 3</strong></td>
<td>17</td>
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<tr>
<td><strong>FALL SEMESTER</strong></td>
<td></td>
<td><strong>SPRING SEMESTER</strong></td>
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<tr>
<td>200 Level Bio Core Course</td>
<td>3</td>
<td>200 Level Bio Core Course</td>
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<tr>
<td>College Physics (Phys 31 &amp; 22)</td>
<td>3</td>
<td>College Physics (Phys 35 &amp; 26)</td>
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<tr>
<td>Advanced Biological Sciences(^b)</td>
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<td>Advanced Biological Sciences(^b)</td>
<td>3</td>
</tr>
<tr>
<td>Humanities elective(^c)</td>
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<td>Humanities elective(^c)</td>
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</tr>
<tr>
<td>Upper level lab</td>
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<td>Biostatistics</td>
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<tr>
<td>Free electives to satisfy graduation requirements</td>
<td>1-2</td>
<td>Upper level lab</td>
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<td><strong>YEAR 3</strong></td>
<td>17-18</td>
<td><strong>YEAR 4</strong></td>
<td>12</td>
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<td><strong>FALL SEMESTER</strong></td>
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<td><strong>SPRING SEMESTER</strong></td>
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<td>Senior Seminar (BIO 310)(^d)</td>
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<td>Advanced Biological Sciences(^b)</td>
<td>3</td>
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<td>2 Advanced Biological Sciences(^b)</td>
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<td>15</td>
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<td>Biochemistry (Chem 361)</td>
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<td>15</td>
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<tr>
<td>Free electives to satisfy graduation requirements</td>
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<td></td>
<td>3</td>
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<tr>
<td><strong>YEAR 4</strong></td>
<td>16</td>
<td><strong>YEAR 5</strong></td>
<td>15</td>
</tr>
</tbody>
</table>

**Notes:**

\(a\) All B.S. majors are required to take Calculus I which can be satisfied with either Math 8 or 14. Advanced Mathematics courses may be recommended as technical electives.

\(b\) Selection of Advanced Biological Sciences courses is left to the discretion of the student and their advisor.

\(c\) Studio art classes do not apply for Humanities electives.

\(d\) All graduating students are required to take the Major Fields Achievement Test (MFAT). The MFAT is offered each semester and the dates will be posted outside the Biology Department Office. Each student is responsible for signing up to take the MFAT.
B.S. Degree Requirements Check-Off Form

HUMANITIES:

_____ 12 Semester Hours, excluding foreign language. Must include two semesters of Rhetoric and Composition, English 20 and English 60 (160). Humanities include: English, Speech, Drama, Art Appreciation, Music Appreciation, Philosophy, Logic, and Literature. NO STUDIO ARTS

SOCIAL SCIENCES:

_____ 9 Semester Hours. Williams Law requires at least one course dealing with the U.S. Constitution (History 112, 175, 176, or Political Science 90). Social Sciences include: History, Political Science, Sociology, Psychology, Economics, and Anthropology.

MATHEMATICS:

_____ A minimum of one year of Mathematics. Must include one semester of Calculus.

PHYSICS:

_____ 2 Semesters of Physics. with lab (Physics 21/31, 22, 25/35 & 26)

CHEMISTRY:

_____ 21 Semester Hours of Chemistry, to include basic Chemistry courses
____ General Chemistry 1, 2, 3, and 4
____ Organic Chemistry Lecture 221, 223, and Labs 226 and 228.
____ Biochemistry 361

BIOLOGICAL SCIENCES:

The following "Core Coursework in Biological Sciences" is required of all majors:
____ BIO. 102: Freshman Seminar, Introduction to Biological Sciences (1 hour)
____ BIO.111 & 112: Principles of Biology Lecture & Lab (5 hours)
____ BIO. 113/114: Biodiversity with Lab (4 hours)
____ BIO. 211/212: Cellular Biology with Lab (4 hours)
____ BIO. 231: Genetics (3 hours)
____ BIO 235 Evolution (3 Hours)
____ BIO. 251: Ecology (3 hours)
____ BIO. 310: Senior Seminar (1 hour)

22 Semester Hours of Advanced Biological Sciences Coursework from the following:
____ BIO. 221/222: Microbiology with Lab (5 hours)____ BIO. 335: Cancer Cell (3)
____ BIO. 235: Evolution (3)____ BIO. 340: Biomaterials (3)
____ BIO. 244: Human Anatomy & Physiology I (3)____ BIO. 354: Freshwater Ecology (3)
____ BIO. 245: Human A & P Lab I (1)____ BIO. 364: Global Ecology (3)
____ BIO. 246: Human Anatomy & Physiology II (3)____ BIO. 358: Caribbean Biodiversity (3)
____ BIO. 247: Human A & P Lab II (1)____ BIO. 370: Toxicology (3)
____ BIO. 315: Developmental Biology (3)____ BIO. 382: Neurobiology (3)
____ BIO. 321: Pathogenic Microbiology (3)____ BIO. 383: Pharmacology (3)
____ BIO. 327: Plant Physiology (3)____ BIO. 388: Biomedical Problems (3)
____ BIO. 331: Molecular Genetics (3)____ BIO. 391: General Virology (3)
____ BIO. 332: Molecular Genetics Lab (2)____ Other Approved Advanced Courses in Science or Engineering
____ BIO. 201/301: Experimental Courses: Genomics (3) Microbial Genetics (3), Nanobiotechnology (2)

Note: Undergraduate students may enroll in graduate level courses with consent of instructor.

ELECTIVES:
Sufficient elective coursework to provide MINIMUM of 130 Semester Hours required for graduation in the College of Arts & Sciences.
Degree Requirements for B.A. in Biological Sciences

Anyone receiving a B.A. degree in Biological Sciences from Missouri S&T must complete the following academic requirements:

**HUMANITIES:** 18 Semester hours
- Must include: English 20 Exposition and Argumentation (3 Hours)
- English 60 Writing and Research or 160 Technical Writing (3 Hours)
- At least one course in each of: Literature, Philosophy, Fine Arts

**SOCIAL SCIENCES:** 18 Semester hours
- Must include: History 111 Early Western Civilization (3 Hours)
- History 112 Modern Western Civilization (3 Hours)
- At least one course in two: Economics, Political Sciences, Psychology

**FOREIGN LANGUAGE:** 11 Semester hours

**MATHEMATICS/PHYSICAL SCIENCE:** 9 Semester hours
- Must include: At least one course in each of Math, Physics, or Geology
- Proven proficiency at college algebra level

**COMPUTER SCIENCE/STATISTICS:** 3 Semester hours
- Must include: 3 semester hours of Computer Science or Statistics

**CHEMISTRY:** 19 Semester hours
- Must include: Chemistry 1,2,3, and 4 General Chemistry (9 hours)
- Chemistry 221,223 Organic Chemistry (6 hours)

**BIOLOGICAL SCIENCES:** 30 Semester hours
- Must include: 21 Semester hours of required core coursework
  - BIO 102: Introduction to Biological Sciences (1 hour)
  - BIO 111: Principles of Biology (3 hours)
  - BIO 112: General Biology Lab (2 hours)
  - BIO 113: Biodiversity (3 hours)
  - BIO 114: Biodiversity Lab (1 hour)
  - BIO 211: Cellular Biology (3 hours)
  - BIO 212: Cell Bio Lab (1 hour)
  - BIO 231: Genetics (3 hours)
  - BIO 251: Ecology (3 hours)
  - BIO 310: Senior Seminar (1 hour)
- 9 Semester hours of advanced elective coursework (200 level or above—see page 30)

**ELECTIVES:** 16 Semester hours
- Sufficient elective coursework to provide MINIMUM of 120 Semester Hours required for graduation in the College of Arts & Sciences.

**Advanced Placement in Biology:**
- Students who score a “4” on the Advanced Placement Biology Exam will receive three credit hours for Bio 110/111. A score of “5” on the same exam will earn the student five credit hours for Bio110/111 and 112 General Biology Laboratory.

**MFAT:**
- All graduating students are required to take the Major Fields Achievement Test (MFAT) as their Senior Assessment and are responsible for signing up to take it. The MFAT is offered each Semester; the dates will be posted outside the Biology Department office.
# B.A. in Biological Sciences (Sample Schedule)

This is one possible class schedule for completion of a B.A. in Biological Sciences. You should plan your personal schedule in consultation with your academic advisor.

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>FIRST SEMESTER</td>
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</tr>
<tr>
<td>Intro to Biological Sciences (BIO 102)</td>
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</tr>
<tr>
<td>General Biology (BIO 111)</td>
<td>3</td>
</tr>
<tr>
<td>General Biology Lab (BIO 112)</td>
<td>2</td>
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<tr>
<td>Mathematics(^a)</td>
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<tr>
<td>English 20 or Humanities Elective</td>
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<tr>
<td>Intro to Lab Safety and HazMat (Chem 4)</td>
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<tr>
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<tr>
<td>Biodiversity with lab (BIO 113/114)</td>
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<tr>
<td>General Chemistry (Chem 1)</td>
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</tr>
<tr>
<td>General Chemistry Lab (Chem 2)</td>
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<td>Cellular Biology (BIO 211)</td>
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<td>Cellular Biology lab (BIO 212)</td>
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<td>General Chemistry (Chem 3)</td>
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<td>Physics or Geology</td>
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</tr>
<tr>
<td>Language I</td>
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<td><strong>Total</strong></td>
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<tr>
<td>FOURTH SEMESTER</td>
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<td>General Genetics (BIO 231)</td>
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<td>Physics or Geology</td>
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<td>Language II</td>
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<tr>
<td>English 60 Writing and Research</td>
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<tr>
<td>FIFTH SEMESTER</td>
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<tr>
<td>Advanced Biology(^b)</td>
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<tr>
<td>Organic Chemistry I (Chem 221)</td>
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<td>Organic I Lab (Chem 226)</td>
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<td>Language III</td>
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<tr>
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</tr>
<tr>
<td>Ecology (BIO 251)</td>
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<tr>
<td>Organic Chemistry II (Chem 223)</td>
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<td>Social Science Elective</td>
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<table>
<thead>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>SEVENTH SEMESTER</td>
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<tr>
<td>Advanced Biology(^b) or Biochemistry</td>
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<tr>
<td>Senior Seminar (BIO 310)(^d)</td>
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</tr>
<tr>
<td>Humanities Elective(^c)</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Free Electives</td>
<td>3</td>
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<tr>
<td><strong>Total</strong></td>
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<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>EIGHTH SEMESTER</td>
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<tr>
<td>Humanities Elective(^c)</td>
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<tr>
<td>Social Science Electives</td>
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<tr>
<td>Free Electives</td>
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<tr>
<td><strong>Total</strong></td>
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</tbody>
</table>

Notes:

\(^a\) All B.A. majors are required to take College Algebra. Advanced Mathematics courses may be recommended as electives.

\(^b\) Selection of Advanced Biological Sciences courses is left to the discretion of the student and their advisor.

\(^c\) Studio art classes do not apply for Humanities electives.

\(^d\) All graduating students are required to take the Major Fields Achievement Test (MFAT) as their Senior Assessment and are responsible for signing up to take it. The MFAT is offered each Semester; the dates will be posted outside the Biology Department office.
**B.A. with Pre-Med Emphasis Degree Requirements**

Anyone receiving the B.A. degree in Biological Sciences with a Pre-Medicine emphasis from Missouri S&T must complete the following academic requirements:

### HUMANITIES:

18 Semester hours  
Must include: English 20 Exposition and Argumentation (3 Hours)  
English 60 Writing and Research or 160 Technical Writing (3 Hours)  
At least one course in each of: Literature, Philosophy, Fine Arts

### SOCIAL SCIENCES:

18 Semester hours  
Must include: History 111 Early Western Civilization (3 Hours)  
History 112 Modern Western Civilization (3 Hours)  
At least one course in two: Economics, Political Sciences, Psychology

### FOREIGN LANGUAGE:

11 Semester hours

### MATHEMATICS/PHYSICAL SCIENCE:

13-15 Semester hours  
Must include: At least one course in Math  
2 Semesters of Physics with Lab (Phy. 21 or 31, 22, 25 or 35, and 26)  
Proven proficiency at college algebra level (Some med schools require Calc I)

### COMPUTER SCIENCE/STATISTICS:

3 Semester hours  
Must include: 3 semester hours of Computer Science or Statistics

### CHEMISTRY:

17 Semester hours  
Must include: Chemistry 1,2,3, and 4 General Chemistry (9 hours)  
Chemistry 221,223,226, and 228 Organic Chemistry and Labs (8 hours)

### BIOLOGICAL SCIENCES:

30 Semester hours  
Must include: 21 Semester hours of required core coursework  
BIO 102: Introduction to Biological Sciences (1 hour)  
BIO 111: Principles of Biology (3 hours)  
BIO 112: General Biology Lab (2 hours)  
BIO 113: Biodiversity (3 hours)  
BIO 114: Biodiversity Lab (1 hour)  
BIO 211: Cellular Biology (3 hours)  
BIO 212: Cell Bio Lab (1 hour)  
BIO 231: Genetics (3 hours)  
BIO 251: Ecology (3 hours)  
BIO 310: Senior Seminar (1 hour)  
9 Semester hours of advanced elective coursework (200 level or above—see page 30)  
(Biology 241 or 242 and Chemistry 361 recommended)

### ELECTIVES:

16 Semester hours  
Sufficient elective coursework to provide MINIMUM of 120 Semester Hours required for graduation in the College of Arts & Sciences.

### Advanced Placement in Biology:

Students who score a "4" on the Advanced Placement Biology Exam will receive three credit hours for Bio 110/111. A score of "5" on the same exam will earn the student five credit hours for Bio110/111 and 112 General Biology Laboratory.

### MFAT:

All graduating students are required to take the Major Fields Achievement Test (MFAT) as their Senior Assessment and are responsible for signing up to take it. The MFAT is offered each Semester; the dates will be posted outside the Biology Department office.
### B.A. with Pre-Med Emphasis (Sample Schedule)

This is one possible class schedule for completion of a BA in Biological Sciences with Pre-Medicine emphasis. You should plan your personal schedule in consultation with your academic advisor.

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
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<tr>
<td><strong>FIRST SEMESTER</strong></td>
<td></td>
<td><strong>SECOND SEMESTER</strong></td>
<td></td>
</tr>
<tr>
<td>Intro to Biological Sciences (BIO 102)</td>
<td>3</td>
<td>Biodiversity with lab (BIO 113/114)</td>
<td>4</td>
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<tr>
<td>General Biology (BIO 111)</td>
<td>2</td>
<td>General Chemistry (Chem 1)</td>
<td>4</td>
</tr>
<tr>
<td>General Biology Lab (BIO 112)</td>
<td>5</td>
<td>General Chemistry Lab (Chem 2)</td>
<td>1</td>
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<tr>
<td>Mathematics*a</td>
<td>3</td>
<td>Western Civilization I (Hist 111)</td>
<td>3</td>
</tr>
<tr>
<td>English 20 or Humanities Elective*c</td>
<td>1</td>
<td>English 20 or Humanities Elective*c</td>
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</tr>
<tr>
<td>Intro to Lab Safety and Haz. Mat. (Chem 4)</td>
<td>15</td>
<td></td>
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<tr>
<td><strong>THIRD SEMESTER</strong></td>
<td></td>
<td><strong>FOURTH SEMESTER</strong></td>
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<tr>
<td>Cellular Biology (BIO 211/212)</td>
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<td>Physics II</td>
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<td>General Chemistry (Chem 3)</td>
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<td>Physics II Lab</td>
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<td>Physics I</td>
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<td>Language II</td>
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<tr>
<td>Physics I Lab</td>
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<td>Western Civilization II (Hist 112)</td>
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<td>Language I</td>
<td>4</td>
<td>English 60 Writing and Research</td>
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<td>16</td>
<td></td>
<td>15</td>
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<td><strong>FIFTH SEMESTER</strong></td>
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<td><strong>SIXTH SEMESTER</strong></td>
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<td>Free Electives</td>
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<td>Human Physiology (BIO 242)</td>
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<td>Organic Chemistry I (Chem 221)</td>
<td>4</td>
<td>Organic Chemistry II (Chem 223)</td>
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<tr>
<td>Organic I Lab (Chem 226)</td>
<td>1</td>
<td>Organic II Lab (Chem 225)</td>
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<tr>
<td>Language III</td>
<td>3</td>
<td>Humanities Elective*c</td>
<td>3</td>
</tr>
<tr>
<td>Statistics / Computer Science</td>
<td>3</td>
<td>Social Science Elective*c</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td><strong>SEVENTH SEMESTER</strong></td>
<td></td>
<td><strong>EIGHTH SEMESTER</strong></td>
<td></td>
</tr>
<tr>
<td>Ecology (BIO 251)</td>
<td>3</td>
<td>General Genetics (BIO 231)</td>
<td>3</td>
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<tr>
<td>Advanced Biology*b or Biochemistry</td>
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<td>Senior Seminar (BIO 310)*</td>
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<td>Free Electives</td>
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<td>Social Science Elective</td>
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<tr>
<td>RETAKE MCAT (Offered several times)</td>
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<tr>
<td>APPLY TO MEDICAL SCHOOL</td>
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<tr>
<td>(for admission next Fall)</td>
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</tbody>
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**Notes:**

- **a** All B.A. majors are required to take College Algebra. Advanced Mathematics courses may be recommended as electives.
- **b** Selection of Advanced Biological Sciences courses is left to the discretion of the student and their advisor.
- **c** Studio art classes do not apply for Humanities electives.
- **d** All graduating students are required to take the Major Fields Achievement Test (MFAT) as their Senior Assessment and are responsible for signing up to take it. The MFAT is offered each Semester; the dates will be posted outside the Biology Department office.
### B.A. with Teacher Certification Degree Requirements

Anyone receiving the B.A. degree in Biological Sciences-Teacher Certification from Missouri S&T must complete the following academic requirements:

#### HUMANITIES: 18 Semester hours
- **Must include:**
  - English 20: Exposition and Argumentation (3 Hours)
  - English 60: Writing and Research or 160 Technical Writing (3 Hours)
  - Speech 85: Principle of Speech (3 Hours)
  - At least one course in each of: Fine arts, Literature and Philosophy

#### SOCIAL SCIENCES: 15 Semester hours
- **Must include:**
  - History 111: Early Western Civilization (3 Hours)
  - History 112: Modern Western Civilization (3 Hours)
  - History 275: History of Science (3 hours)
  - Political Science 90: American Government (3 Hours)
  - Psychology 50: General Psychology (3 Hours)

#### MATHEMATICS/PHYSICAL SCIENCE: 9 Semester hours
- **Must include:**
  - Math 3 or higher (3 Hours)
  - Physics 31 (3 Hours)
  - Geology 51 (3 Hours)

#### COMPUTER SCIENCE/STATISTICS: 3 Semester hours
- **Must include:**
  - 3 semester hours of Computer Science or Statistics

#### CHEMISTRY: 17 Semester hours
- **Must include:**
  - Chemistry 1, 2, 3, and 4 General Chemistry (9 hours)
  - Chemistry 221, 223 Organic Chemistry (6 hours)

#### BIOLOGICAL SCIENCES: 27 Semester hours
- **Must include:**
  - 27 Semester hours of required core coursework
    - BIO 102: Introduction to Biological Sciences (1 hour)
    - BIO 111: Principles of Biology (3 hours)
    - BIO 112: General Biology Lab (2 hours)
    - BIO 113: Biodiversity (3 hours)
    - BIO 114: Biodiversity Lab (1 hour)
    - BIO 151: Introduction to Environmental Science (3 hours)
    - BIO 211: Cellular Biology (3 hours)
    - BIO 212: Cell Bio Lab (1 hour)
    - BIO 231: Genetics (3 hours)
    - BIO 235: Evolution (3 hours)
    - BIO 251: Ecology (3 hours)
    - BIO 310: Senior Seminar (1 hour)

#### EDUCATION CERTIFICATE: 42 Semester Hours
- **Must include:**
  - Education 40: Perspectives in Education (2 Hours)
  - Education 104: Teaching Field Experience (2 Hours)
  - Education 164: Aiding Elementary, Middle and Secondary School (2 Hours)
  - Education 174: School Organization (2 Hours)
  - Education 216: Teaching Reading in Content Area (3 Hours)
  - Education 251: Historical Foundation American Education (3 Hours)
  - Education 280: Teaching Methods and Skills in Content Area (6 Hours)
  - Education 298: Student Teaching Seminar (1 Hour)
  - Education 299: Student Teaching (12 Hours)
  - Psychology 155: Educational Psychology (3 Hours)
  - Psychology 208: Psychological & Educational Development (3 Hours)
  - Psychology 354: Psychology of the Exceptional Child (3 Hours)
## Advanced Biological Sciences Coursework

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<tr>
<td>BioSci 221</td>
<td>Microbiology</td>
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<td>BioSci 222</td>
<td>Microbiology Lab</td>
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<tr>
<td>BioSci 244</td>
<td>Human Anatomy and Physiology 1</td>
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<td>BioSci 245</td>
<td>Human Anatomy and Physiology Lab 1</td>
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<td>BioSci 246</td>
<td>Human Anatomy and Physiology 2</td>
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<td>BioSci 247</td>
<td>Human Anatomy and Physiology Lab 2</td>
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<td>BioSci 315</td>
<td>Developmental Biology</td>
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<td>BioSci 321</td>
<td>Pathogenic Microbiology</td>
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<td>BioSci 331</td>
<td>Molecular Genetics</td>
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<td>BioSci 332</td>
<td>Molecular Genetics Lab</td>
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<td>BioSci 334</td>
<td>Genomics</td>
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<td>BioSci 335</td>
<td>Cancer Cell Biology</td>
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<td>BioSci 336</td>
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<td>BioSci 338</td>
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<td>BioSci 338</td>
<td>Pharmacology</td>
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<tr>
<td>BioSci 338</td>
<td>Biomedical Problems</td>
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New Course offerings: Genomics (3 hours), Microbial Genetics (3)

*It may be possible for undergraduate students to take graduate level courses with the approval of the instructor*

### Approved Out-of-Department Courses

<table>
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<td>Biochemistry Lab</td>
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<tr>
<td>Chemistry 363</td>
<td>Intermediary Metabolism</td>
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<td>Chem Eng 263</td>
<td>Biochemical Separations</td>
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<td>Chem Eng 264</td>
<td>Biochemical Separations Laboratory</td>
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</tr>
<tr>
<td>Chem Eng 266</td>
<td>Biochemical Reactor Laboratory</td>
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<tr>
<td>Env Eng 262</td>
<td>Biological Fundamentals of Environmental Engineering</td>
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<tr>
<td>Env Eng 262</td>
<td>Public Health Engineering</td>
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</tr>
<tr>
<td>Env Eng 265</td>
<td>Sustainability, Population, Energy, Water, and Materials</td>
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<tr>
<td>Geol 227</td>
<td>Systematic Paleontology</td>
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<td>Geol 329</td>
<td>Micropaleontology</td>
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<tr>
<td>Nuc Eng 333</td>
<td>Applied Health Physics</td>
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<tr>
<td>Psych 330</td>
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### 3-Year Course Offering Plan

This proposed schedule of course offerings is only a recommendation and is subject to change. We are offering this plan so you can anticipate when a course is likely to be offered and schedule your courses accordingly. It is highly recommended that you discuss your plans with your advisor who will be aware of any changes in this schedule.

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Summer Courses are occasionally offered and may include: General Biology (Bio 110), General Biology Lab (Bio 112), Cell Biology (Bio 211) and/or Cell Biology Lab (Bio 212), Field Ecology, Ozark Botany
Registration Procedures

Advising week for the following semester occurs during the 10th week of the Fall and Winter Semester.

In the Biology Department, most First Year Student advising is handled by Dr. Ron Frank and Terry Wilson. After completing your first semester you will be assigned an academic advisor based on your interests or other factors. Your assigned advisor can be found through Joe’Ss. If you do not have an advisor listed, check with Jessica Pelc in the Biology Department office.

Each advisor handles their advising differently so consult with your advisor about their preferred procedure for academic advising. Prior to advising week, contact your advisor to either make an appointment to meet with them during advising week to discuss your courses or present them with a proposed class schedule. Some advisors will post a schedule of open advising times during advising week. Others may e-mail you to schedule appointments. Others may not require a formal appointment and may only require you to submit a proposed schedule of classes.

Prior to meeting with your advisor you should at least have a basic idea of which classes you would like to take. Obtain a copy of the advising agreement form and fill out the form with courses you plan to take and also alternative choices for courses that may be full. You can check your CAPS report via Joe’Ss to determine which courses you may need to take to fulfill your degree requirements.

The schedule of classes is available through the registrar’s office web site (http://registrar.mst.edu/). Here you will also find instructions for registering for courses on the Joe’Ss website. This site also provides access to your grades, CAPS report, and unofficial transcripts.

Registration for courses is done either by phone or by Joe’Ss. Permission to register is placed on hold until your advisor releases your advising hold. Your advisor can only release advising holds. Other holds may be placed on advising and can only be released through the registrar’s office.

Your registration appointment date and time can be obtained from Joe’Ss. The registration time is the earliest you can register for classes, you do not need to register exactly at that time.
101 Special Topics (Variable) This course is designed to give the department an opportunity to test a new course.

101 Genetics: Decoding Your Genes (3) We will explore the questions: What are genes? How do our genes affect our health? How are genes inherited? What are the societal implications of genetic knowledge? What is the Human Genome Project and what can we learn from it? (No Prereq, Designed for non-majors, Does NOT fulfill requirement for Biology majors).

102 Introduction to Biological Sciences (1) An introduction to the study of biology at S&T. Students will consider personal and professional opportunities within the various areas of biology and become acquainted with the Biological Sciences faculty and departmental and campus facilities. (Required of Biological Sciences majors).

110 General Biology (3) A comprehensive study of the general principles of the biology of plants, animals, and protists including population biology and regulation mechanisms. This course is for Non-Biological Sciences majors. (Entrance requirements)

111 Principles of Biology (3) A comprehensive study of the general principles of the biology of plants, animals, and protists including population biology and regulation mechanisms. This course is for Non-Biological Sciences majors. (Entrance requirements)

112 General Biology Lab (2) The laboratory work accompanying general biology consists of experiments designed to supplement and extend lectures in 110/111. (Preceded or accompanied by Bio 110/111)

113 Biodiversity (3) This course provides a survey of all life, but emphasizes diversity of eukaryotes including protists, fungi, plants, and animals. Emphasis is on form, function, ecology, and evolution of plants and animals and other organisms

114 Biodiversity Lab (1) This lab course is designed to accompany instruction in the Biodiversity class. Lab and field explorations of the varieties of life, with an emphasis is on form, function, ecology, and evolution of plants and animals and other organisms

151 Introduction to Environmental Science (3) An introduction to environmental science, with an emphasis on biological aspects of current environmental problems. Topics range from chemical toxicity to global climate change. Environmental challenges facing local species and ecosystems will be emphasized.

150 Biotechnology and Film (3) Untangling Facts from Fiction at the Movies (3) As advances in biotechnology and biological discoveries increase, so does the inclusion of biology in Hollywood movies. Films that use science-based plots can have a significant impact on society by disseminating scientific facts or by providing misinformation. In this course, popular movies will serve as a starting point for discussing the science behind biology-based Hollywood plots, ascertaining facts from fiction, and understanding the role of public perceptions on science. The course will include screenings of current and classic films, lectures, and discussions. (No Prereq, Designed for non-majors, Does NOT fulfill requirement for Biology majors).

201 Special Topics (Variable) This course is designed to give the department an opportunity to test a new course.


212 Cellular Biology Lab (1) Laboratory work includes microscopy, biochemical assays, enzymology, and genetic analysis. Prerequisite: Preceded or accompanied by Bio Sci 211.

218 Plant Biology (3) An intermediate class covering plant form and function. Topics include the cellular structures unique to plants, their life cycles, and the mechanisms they use to survive, reproduce, and convert solar energy into a form usable by all other organisms. (Prerequisite: Bio 111)
221 Microbiology (3) General introduction to the culture and study of microorganisms, their physiology, structure, and contribution to biology. (Prerequisite: Bio 211)

222 Microbiology Lab (2) (Prerequisite: preceded or accompanied by Bio 221) General introduction to the techniques used for the culture and identification of microorganisms, their physiology, structure, and contribution to biology. Prerequisite: Preceded or accompanied by Bio Sci 221.

231 General Genetics (3) The study of the principles of heredity and reasons for variation in plants and animals. A study of Mendelian principles and population genetics with emphasis on the human.

235 Evolution (3) A survey of the genetic and environmental mechanisms associated with organic evolution.

244 Human Anatomy & Physiology I (3) First Semester of a two semester sequence dealing with the structure and function of human organ systems. (Prerequisite: Bio 111 & Bio 211)

245 Human Anatomy and Physiology I Lab (1) Laboratory accompanying human anatomy & physiology I (Bio 244). This course may be taken separately at a later date. (Prerequisite: Preceded or accompanied by Bio Sci 244)

246 Human Anatomy & Physiology II (3) Second Semester of a two semester sequence dealing with the structure and function of human organ systems. (Prerequisite: Bio 111 & Bio 211)

247 Human Anatomy and Physiology II Lab (1) Laboratory accompanying human anatomy & physiology II (Bio 246). This course may be taken separately at a later date. (Prerequisite: Preceded or accompanied by Bio Sci 246)

251 Ecology (3) Relationships among living organisms and their environments. The structure and function of ecosystems, with emphasis on limiting environmental factors, symbiotic relationships, biogeochemical cycles, food chain relationships, population dynamics, and man in the environment.

300 Special Problems (Variable) Problems or reading on specific subjects or projects in the department. Consent of the instructor is required.

301 Special Topics (Variable) This course gives the department an opportunity to test a new course.

301 Environmental Microbiology (3) The study of microbial growth and kinetics, life in extreme environments, biogeochemical cycling, bioremediation of contaminants, waterborne pathogens, environmental biotechnology. (Prerequisite: Bio 221)

301 Environmental Microbiology Lab (1) Experience will be gained in handling environmental samples. Enrichments will be made for microorganisms with different metabolic capabilities. In addition, the beneficial use of environmental microbes will be explored. Techniques will also be explored for detecting pathogenic bacteria in environmental samples. (Preceded or accompanied by Bio 301 – Environmental Microbiology)

301 Microbial Genetics (3) A study of the mechanisms of the control of gene expression, genetic modification and evolution of microorganism. The course will examine applications of the principles of microbial genetics in genetic engineering through analysis of the current literature in the field. (Prerequisite: Bio 221)

301 Genomics (3) This course offers a general overview of the field of genomics. Topics covered include genome sequencing and annotation, transcriptomics, proteomics, metabolomics, genomic variation, and an overview of human, and several animal, plant, and microbial genome projects. (Prerequisite: Bio 331)

301 Nanobiotechnology (2) Nanobiotechnology has emerged to change human economy and society in many aspects. Applications of nanobiotechnology in life sciences is termed nanobiotechnology. The course describes recent development of nanobiotechnology in fundamental biological research as well as biomedical studies. (Prerequisites Bio 211 and Bio 231)
310 Seminar (1) Biology related service course requiring teamwork. (Prerequisite: Senior standing)

311 Bioinformatics (3) The course will familiarize students with the application of computational methods to biology, as viewed from both perspectives. It will introduce problems in molecular, structural, morphological, and biodiversity informatics, and will discuss principles, algorithms, and software to address them. Prerequisite: Junior standing or above. (Co-listed with Comp Sci 311)

315 Developmental Biology (3) Study of the patterns of development of the vertebrate embryo, the molecular mechanisms of tissue induction, and interactions among developing tissues. (Prerequisites: Bio 115 and Bio 211)

321 Pathogenic Microbiology (3) A study of medically important microorganisms. Students will learn about the properties that enable organisms to cause disease as well as the disease process within the host. Special emphasis will be placed on recent advances in the molecular genetics of host pathogen interaction. (Prerequisite: Bio 221)

331 Molecular Genetics (3 Credit) A study of the properties and functions of DNA that makes this macromolecule unique in the universe. Examples of replication, transcription, translation, repair, and regulation will be examined in viruses, prokaryotes, and eukaryotes. (Prerequisite: Bio 211 and 231)

332 Molecular Genetics Laboratory (2) This course provides experience in the use of a variety of DNA manipulation techniques that are common to molecular studies. These include DNA extraction, restriction mapping, Southern blotting, recombinant plasmid construction, DNA sequencing and analysis, and polymerase chain reaction. (Preceded or accompanied by Bio 331)

335 Cancer Biology (3) An upper level, advanced cell biology course that examines cellular processes that go awry during tumorigenesis. We will discuss cell cycle controls, signal transduction pathways, DNA repair, telomerase, cell migration and adhesion that are altered in cancer cells. (Prerequisite: Bio 211)

340 Biomaterials I (3) This course will introduce senior undergraduates to a broad array of topics in biomaterials, including ceramic, metallic, and polymeric biomaterials for in vivo use, basic concepts related to cells and tissues, host reactions to biomaterials, biomaterials-tissue compatibility, and degradation of biomaterials. (Prerequisite: Senior standing)

341 Tissue Engineering (3) This course will introduce senior undergraduates to the principles and clinical applications of tissue engineering, involving the use of biomaterial scaffolds, living cells, and signaling factors to develop implantable parts for the restoration, maintenance, or replacement of biological tissues and organs.

354 Freshwater Ecology (3) The ecology of streams, lakes, and wetlands. Through the physical and chemical characteristics of freshwater environments, the diversity of life in freshwaters, biogeochemical processes, and threats to freshwater systems. Assignments will include problem sets, short papers, and a group presentation. (Prerequisite: Bio 251)

358 Field Biodiversity (3) This course focuses on the enchantment and reduction of Biodiversity and modern techniques used to measure and monitor it. Topics will include: biogeography, community structures, competition, predation, modeling food webs, geological influences on biology, environmental change, and human impact. (Sophomore standing or above, bio majors get preference, additional costs and field work required)

364 Global Ecology (3) This class will include ecological topics at large scales, including global scales. Topics include biogeochemical cycles of carbon, nitrogen, and other biologically important elements. Global ecosystems and biodiversity will also be discussed, including an examination of current threats and management options.
Biology Undergraduate Course Descriptions (cont.)

370 Toxicology (3) A study of natural and man-make toxicants, various possible routes of exposure, absorption, distribution, biotransformation, specific target sites, and mechanisms, involved in elicitation of toxic effects, as well as detoxification and excretion. (Prerequisite: Bio 115, Bio 211)

382 Neurobiology (3) The biology of nerve cells, particularly neurons as the substrate for higher brain functions. Topics include the electrical properties of cells, synaptic transmission, neural development, neural plasticity, and neuropharmacology. (Prerequisite: Bio 211)

383 Pharmacology (3) The study of chemicals that produce specific biological effects as well as the search for new agents of therapeutic value. We will consider basic principals of drug action at the cellular and molecular levels, the chemotherapy of microbial and neoplastic diseases, and drug action on major physiological systems, including the nervous and cardiovascular systems. (Prerequisite: Bio 211, Organic Chemistry)

388 Biomedical Problems (3) This course will use a problem-based learning approach to examine biological aspects of various medical conditions. Students will work in groups and individually to answer problems related to diagnostic testing and evaluation of diseases and other medical conditions.

390 Undergraduate Research (Variable) Designed for the undergraduate student who wishes to engage in research. Not for graduate credit. Not more than six hours for graduation credit. Subject and credit to be arranged with the instructor. (Prerequisite: Consent of the instructor)

391 General Virology (3) An overview of the field of virology, including plant, animal, and bacterial viruses. Discussions will include morphology, classification, virus-host interactions, genetics, clinical and industrial aspects of viruses, and viruses as model systems for basic biological studies. (Prerequisite: Bio 221)

Biology Graduate Course Descriptions

Students with Senior standing may take graduate courses with permission of the instructor. Undergraduates who enroll in graduate classes may choose to dual enroll to receive both undergraduate and graduate credit. Graduate courses are currently offered on an infrequent, rotating basis. Consult with your advisor when planning your coursework.

401 Special Topics This course is designed to give the department an opportunity to test a new course.

402 Problems in Applied and Environmental Biology Overview of the major areas of research in applied biology and environmental science with a focus on interdisciplinary approaches used on S&T campus in ongoing research.

410 Graduate Seminar Presentation and discussion of current topics in Applied and Environmental Biology

411 Advanced Bioinformatics (See Bio 311)

421 Advanced Microbial Metabolism A survey of the diverse metabolic properties of microorganisms. Course material will emphasize major metabolic pathways and how they relate to microbial diversity and microbial ecology.

435 Advanced Cancer Cell Biology (See Bio 335)
440 Biomaterials II This course will introduce graduate students to a broad array of topics in biomaterials, including ceramic, metallic, and polymeric biomaterials for in vivo use, basic concepts related to cells and tissues, host reactions to biomaterials, biomaterials-tissue compatibility, and degradation of biomaterials. A term paper and oral presentation are required. Prerequisite: Graduate Standing. (Co-listed with Cer Eng 440, Met Eng 440, Chem Eng 440)

441 Tissue Engineering II (See Bio 341)

451 Environmental Microbiology Topics to be explored in this course will include but are not limited to microbial growth and metabolic kinetics, life in extreme conditions, biogeochemical cycling, bioremediation of contaminants, waterborne pathogens, and environmental biotechnology.

452 Astro Biology The origins of life on early Earth and the possibility of life on extraterrestrial bodies will be explored. In addition, the instruments and methods to carry out space travel, necessary for studying the possibility of extraterrestrial life.

454 Advanced Freshwater Ecology (See Bio 354)

455 Bioremediation During this course, the use of microorganisms and other living organisms for the remediation of contaminated environments will be explored along with the techniques necessary for monitoring their activities.

458 Advanced Caribbean Biodiversity (See Bio 358)

470 Advanced Toxicology (See Bio 370)

475 Techniques in Applied and Environmental Biology Students will have the opportunity for hands on experience with the various techniques used in the modern biology laboratory. Techniques will include gene cloning, DNA sequencing, protein purification, growth and development of various model organisms, data acquisition.

490 Graduate Research Investigation of an advanced nature leading to the preparation of a thesis or dissertation.
Some faculty will be using Blackboard extensively in their classes. Blackboard is a comprehensive and flexible e-Learning software platform that delivers a course management system that provides:

A handy source of information such as the syllabus, assignments and other course documents, through the web.

Additional communication tools such as e-mail to classmates, digital dropbox for submitting assignments.

Timely announcements and course calendar.

On-line quizzes and daily assignments.

Current grade information.

To get to course material in Blackboard, follow these steps:

Using a web browser go to: [http://blackboard.mst.edu](http://blackboard.mst.edu) (you must accept cookies to login).

You can also access this site through the course web page.

Enter your username - the same text as in your e-mail before the @mst.edu.

Your password is the same password you use to access your e-mail. If your password does not work, follow the instructions on the login page for syncing your password.

Select Login.

Select the “Courses” tab to access the courses in which you are enrolled. There may be separate courses for lecture and lab.

Select the course you wish to access. Here you can see announcements and the buttons for all the options to be used in the class. The descriptions are fairly self-explanatory.

Usually you can access copies of the class syllabi, handouts and PowerPoint presentations by selecting “Course Documents”.

Assignments and quizzes can be accessed by selecting "Assignments".

If you want to see the documentation or seek other help, use the help button on the top.

Check out Blackboard at the beginning of the semester and let the instructor know if you have any problems accessing the site or any of the content.

Good luck!
Minors

Biological Sciences students frequently choose to minor in other disciplines. Below are the requirements for some of the more popular minors.

**Bioinformatics Minor**

- Principles of Biology (Bio 111 and 112) 5
- Cellular Biology (Bio 211) **Or** General Genetics (Bio 231) 3
- Molecular Genetics (Bio 331) 3
- Introductory Programming and Labs (CompSci 53 and 54) 4
- Data Structures I (CompSci 153) 3
- File Structure and Introduction to Database Systems (CompSci 238) 3
- *Bioinformatics (Bio 311/CompSci 311) 3
- **Biostatistics** Variable
- ***One additional course** Variable

* (It is strongly recommended that this course be taken after the other Bio and CompSci requirements)

** (An option of Biostatistics (Stat 301 - 4 hrs) or Regression Analysis (Stat 346 - 3 hrs) or Statistical Data Analysis (Stat 353 - 3 hrs) can be taken)

*** (One additional courses, 200 or above in Math, or 300 or above in Bio or CompSci, outside of the major area of study, and as agreed upon by the minor advisor (3+ hrs))

Check the course catalog for detailed information

**Chemistry Minor**

Virtually all BioSci majors fulfill the requirements for a minor in chemistry in the normal course of their training. There has been some confusion regarding the requirements for this minor; in particular Chem 8 is not always required. The following guidelines come from the Chemistry Department:

A minor in chemistry can be obtained by completing 19 hours in chemistry including the following courses in Chemistry: 1, 2, 3, 4, 8, 221, and either 224 or 226 (these total 16). The remainder can be from 151, 2xx, or 3xx courses. Biochemistry is a popular elective (361/362).

Bio. Sci. majors take most of these courses as part of their curriculum. The exception is often Chem. 8 (Qualitative Analysis, lab, 2 hrs). Students who have not taken Chem. 8, may substitute for it, but then they are required to take a total of 21 hours of chemistry.

The BioSci B.S. curriculum calls for Chem 1, 2, 3, 4, 221, 223, 226, 228, and 361, a total of 22 hours. So most of our students already qualify for a Chem minor.

To obtain a minor in Chemistry, fill out a green “minor form” (available in the BioSci office) listing all your chemistry courses. Take this to Dr. Paul Nam, the Chemistry minor advisor, for his signature, then bring it to the registrar.

**Psychology Minor**

The department offers four minor optional degree programs in psychology that psychology majors may pursue. To qualify, students must take 15 hours of courses in psychology and at least nine of these hours must be at the 200-level or above.

The four options for a minor are:
- General Psychology
- Industrial/Organizational Psychology
- Psychology of Leadership
- Cognitive Neuroscience
- Multiculturalism & Diversity
Cooperative Education Program (Co-op)

Biological Sciences students may choose to apply for the Co-op program. The Co-op program provides students with the opportunity to acquire work experience related to their academic or career goals. Students interested in this program should contact the Career Opportunities Center (COC) which is located in 303 Norwood Hall or visit their website at [http://career.mst.edu/](http://career.mst.edu/). The following information is taken from the COC website.

To be eligible to participate in the Co-op Program, a student must be a full-time student when applying for and while participating in the co-op program. (Full-time is defined as satisfactorily carrying and passing a minimum of 12 credit hours in a fall or spring semester and a minimum of 6 hours in a summer session.) A student must have at least a cumulative GPA of 2.0 out of 4.0 to apply to and participate in the program. The student must not be on any type of probation. The actual amount of academic work which must be completed before being selected for the program or before beginning a work period is up to the employer, but a student must have completed at least two semesters. Other eligibility requirements may be established by the sponsoring company with the concurrence of S&T. Financial need is not a determining factor as to which students are employed. A transfer student may register for co-op as soon as they begin classes. A transfer student who is participating in a co-op program through another institution may transfer and continue the co-op affiliation subject to S&T's guidelines.

Registration

Students beginning their first work term in the summer are required to register with the University if the position results from a Career Opportunities Center facilitated interview or resume referral. All other students may register for their co-op work term. Advantages of registering for Fall/Winter semester co-op work terms include: maintaining continuously enrolled status for insurance and loan purposes, not having to apply for re-admission to the University to attend classes following co-op, and having preregistration information for the next semester mailed to the co-op student. To apply for academic credit for co-op work through the student's department the student must be registered for the work session. Students pay a fee equivalent to the cost of one hour of instruction when they register for their co-op work term. The program is conducted to allow the co-op student to enter and leave the university and the work location with a minimum of inconvenience. Degree credit is awarded for co-op experience at the discretion of the student's academic department.

Selection Process

Selection of co-op participants is usually made after on-campus interviews with representatives of the participating companies. Students must be registered with the Co-op Office of the Career Opportunities Center and have a transcript on file before interviewing. Some companies may not conduct on-campus interviews. In these instances resumes will be forwarded to the company by the Co-op Office. Co-op employers sign an agreement to participate in the program. Students may identify an employer to participate in the program, and the Co-op Office will assist in registering the employer.

Co-op Schedule

Participants in the co-op program work and attend school on an alternating schedule. S&T's academic year is composed of two semesters and a summer session. The summer session, although only eight weeks long, is considered a co-op work period. The academic schedule is based on approximately 17 credit hours per regular semester and seven credit hours for a summer session. The work periods vary in length, but are approximately 16 weeks in the fall, 20 weeks in the spring, and 12 weeks in the summer. While students typically alternate full-time work at an employer, with full-time classes on campus, it is possible to work a semester and a summer straight-through, or in a few instances to go to school and work at the same time. Unless schedules are changed upon agreement by the co-op office, student and employer, participants may not remain away from campus for more than eight consecutive months.

On the Job

Salaries and wages vary from one company or location to another, as do the benefits extended to co-op students. Wages may be increased to take into account progress toward a degree and accrued work experience. S&T does not set pay rates for any participating company or agency.
Undergraduate Research

Your undergraduate educational experience can be greatly enhanced by participating in undergraduate research. Hands-on experience can be invaluable when seeking a job or graduate school after completing your bachelor’s degree.

S&T's Biology department has a strong reputation for close interactions between faculty and undergraduate students (in contrast with large research universities where undergraduate students are mostly supervised by post-doctoral fellows or graduate students). Options for undergraduate research include volunteering, BioSc 390 credit, Opportunities for Undergraduate Research Experience (OURe) program or paid research assistant positions. S&T students also take advantage of summer undergraduate research programs at other universities.

Volunteering – If you are seeking an opportunity to observe the research environment in a particular lab, volunteering may be a first step before deciding if that lab is the right lab for you.

BioSc 390 – Students may register for up to 6 credit hours of independent study which can then apply to completion of their electives. In the Biology department, a maximum of three credit hours of BioSc 390 can be applied as Advanced Biological Science electives. An additional three credit hours can be applied to general electives. For every credit hour, a student is expected to work three hours per week in the laboratory or on library research.

OURe - Faculty in the department have extensive experience training undergraduate students through the S&T OURe program. The OURe program is a S&T-sponsored approach to incorporate undergraduate students in research activities. Students submit a brief proposal in consultation with a faculty mentor and determine a time frame for completing the project. At the conclusion of their research projects, students are required to submit written reports of their research findings and are encouraged to submit a paper for an annual Undergraduate Research Conference poster or oral presentation. Participants in the S&T OURe program have an excellent record of acceptance into graduate and professional schools. The application deadline for the OURe program is April 1 for the following Academic year. Applications and further information can be found at http://campus.S&T.edu/ugs/OURe.htm.

Research Assistants – Faculty with funded research projects are often seeking undergraduate students to assist in their research projects. Positions are available on a limited basis and obtaining a paid position can be very competitive. You do not have to limit yourself to working with Biology faculty. Faculty members in other departments are often willing to mentor our hard-working and dedicated students.
**Undergraduate Research (cont.)**

**Summer Research Programs** - Many summer research opportunities are available at other Universities. Check the bulletin boards outside the Biology, Chemistry, Chemical and Biological Engineering and other department offices for announcements about summer research programs. Also check with your fellow students. The Helix Club and the Schrenk Society often invite students who have participated in summer research to talk about their experiences. You can also visit websites such as the National Science Foundation (NSF) (http://www.nsf.gov) or the Howard Hughes Medical Institute (HHMI) (http://www.hhmi.org) for links to Universities that have summer research programs sponsored by these organizations. Below is a brief description of the NSF program.

The NSF funds a large number of research opportunities for undergraduate students through its REU Sites program. An REU Site consists of a group of ten or so undergraduates who work in the research programs of the host institution. Each student is associated with a specific research project, where he/she works closely with the faculty and other researchers. Students are granted stipends and, in many cases, assistance with housing and travel. Undergraduate students supported with NSF funds must be citizens or permanent residents of the United States or its possessions. An REU Site may be at either a US or foreign location.

By using the web page, Search for an REU Site (http://www.nsf.gov/home/crssprgm/reu/reu_search.cfm), you may examine opportunities in the subject areas supported by various NSF units. Also, you may search by keywords to identify sites in particular research areas or with certain features, such as a particular location.

Students must contact the individual sites for information and application materials. NSF does not have application materials and does not select student participants. A contact person and contact information is listed for each site.

Similar opportunities are available through the Howard Hughes Medical Institute. The website http://www.hhmi.org/grants/reports/scienceopp/main contains a searchable database of HHMI sponsored programs.

**Undergraduate Research Presentations** - Of course, participation in undergraduate research would not be complete without presenting the results of that research. Numerous opportunities are available for presentation of your research. Faculty may invite their students to give presentations at local, regional or even national conferences such as the Missouri Academy of Sciences and the American Society for Microbiology regional and national meetings. The presentations may be either posters or oral presentations. Students are also invited to submit papers and make a poster or oral presentation for the Annual Undergraduate Research Conference. The Undergraduate Research Conference is held in April and the top three posters and oral presentations receive awards or $750, $500 and $250. Every year since 2006, Biological Sciences students have placed in the top three oral and poster presentations in the Natural Sciences category. Look around the department for examples of posters that your fellow students have presented at various meetings. For more information on the Undergraduate Research Conference visit their website at http://campus.S&T.edu/ugs/UGRC.html
Jobs are occasionally available in the Biology Department. Check the work-study job listings, human resources website or contact individual faculty about available positions in their laboratories. Most positions are filled through personal contacts with faculty. Faculty prefer to hire students who do well in their classes and are known to be hard workers. So talk to your professors, learn about their research and teaching interests and do your best in your classes to show what you are capable of doing. Here are some examples of the types of jobs available in the department.

**Dishwashers** – The large number of laboratory classes offered in the Biology department and the increasing number of research projects generate a large amount of glassware that requires washing. These jobs are typically filled by students with work-study funding. If you are eligible for work-study, available jobs in the Biology department are included in the campus list of work-study positions.

**Animal Lab** – Students are hired to help maintain the S&T Animal Research Facility. The duties of this position include feeding the animals and cleaning their cages and changing their bedding. These positions are typically filled by work-study students.

**Research Assistants** – Biology department faculty with funded research projects, frequently seek students to work as research assistants. Arrangements are made with the individual faculty member. Most faculty have laboratory web pages describing their research interests. If you find a lab that interests you, contact the professor about available positions in their lab. These positions are very competitive.

**Teaching Assistants** – Undergraduate students are needed to support the numerous laboratory classes offered in the department. Duties may include preparing media, lab set-up and lab clean-up. TAs are usually expected to be available during the lab period to help with answering questions and demonstrating techniques. Students who have already taken the lab and who had done well in the lab are typically hired for these positions. Faculty members typically identify those students in the laboratory class and invite them to serve as TAs the next time the course is offered. However, it does not hurt to ask your professors about the availability of TA positions for a specific course.
Applying to Graduate Schools

Many S&T Biology alumni, continue on to graduate school after completing their bachelors degree. Alumni have gone on to such prestigious grad schools such as Duke, Northwestern, Washington University, and in fields as diverse as Ecology, Evolution, Immunology, Microbiology.

If you are considering graduate school as a option after completing your bachelors degree, you should prepare yourself as early as possible. You should be aware that graduate schools will require that you take the Graduate Record Exam (GRE). Most schools will require only the general test but others may require a Subject test such as the Biology or Biochemistry and Molecular Biology Subject tests. Information on taking the GRE can be found on their website at (http://www.gre.org/). You can register online to take the exam. Most testing locations now use a computer based exam which is offered multiple times during the year. However, the paper version of the exam is offered only three times per year. You can also check with the S&T Career Opportunities Center for information. Most graduate schools will be looking for GRE scores of at least 1200 and some of the more competitive programs will be looking for GRE scores above 1400.

It is also recommended that you gain exposure to research experience prior to applying to graduate school. There are numerous opportunities to get research experience at S&T, including the Opportunities for Undergraduate Research Experience (OURE) program, Bio Sci 390 credit, volunteering, paid research assistant positions, etc. You do not have to limit yourself to working with Biology faculty. Faculty members in other departments are often willing to mentor our hard-working and dedicated students. In addition, it is advisable to look into summer research opportunities at other Universities. Check the bulletin boards outside the Biology, Chemistry, Chemical and Biological Engineering and other department offices for announcements about summer research programs. Also check with your fellow students. The Helix Club and the Schrenk Society often invite students who have participated in summer research to talk about their experiences. You can also visit websites such as the National Science Foundation (http://www.nsf.gov) or the Howard Hughes Foundation (http://www.hhmi.org) for links to Universities that have summer research programs sponsored by these organizations.

As you consider graduate school opportunities, talk with your instructors about their experiences and seek their advice about choosing a University for graduate school. We have all been down that road ourselves and we would be happy to help.
Medical and Professional School Application FAQ

Applying to professional schools is a time-consuming process. You need to be aware of the timeframe early in your academic career so that you can plan accordingly. However, even if you are late in your undergraduate career, you can still prepare to apply to professional school after graduation. This FAQ is provided to help you with the process.

1. **When should first contact be made with the Pre-Health Professions Advisory Committee?**
   
   We recommend that a pre-health student contact a member of the Pre-Medical Advisory Committee during the student’s first year at S&T. The sooner we know a student’s intent to pursue health professions as a career, the better we can advise them.

2. **When would the admission process begin?**
   
   AMCAS (American Medical Colleges Admission Service) begins accepting applications mid June for the entering class for Fall of the following year. **[Yes, over a year in advance!]** For other professional schools, check the appropriate application service or the specific school in which you are interested. [i.e. AAMC (osteopathic medicine), AADAS (dental school)]

3. **When is the admission deadline for most medical schools?**
   
   The standard application deadline for regular admissions is Nov. 1; some may be earlier, so check websites for each medical school OR [www.aamc.org](http://www.aamc.org) or the Medical School Admissions Record (MSAR) for exact dates. However, it is recommended that you apply as early as possible.

4. **What is needed for the admissions process?** [courses finished, tests taken]
   
   Each professional school will require an admissions test such as the MCAT, DAT, PCAT or GRE before they review your application. The MCAT exam is offered several times a year from January to September. The GRE is also offered several times. All tests are computer based and offered in testing centers. Spaces are limited so plan early for when you want to take the test. Be aware that MCAT scores will be released 30 days following the exam so the September score will not be available until October. This may be too late for schools with early application deadlines. Many students take the MCAT exam more than once.

5. **What courses should be completed before taking the entrance exam?**
   
   For the MCAT, It is assumed that the minimum course requirements for admission to medical school will have been taken before attempting the exam. The exam is designed to test your knowledge of these subjects. The minimum requirements generally consist of a year of biology, two years of chemistry (one year of inorganic, one year of organic), a year of physics, one year of writing. Similar preparation is expected for most admissions tests.

6. **Should a student review this course work before taking the admissions test?**
   
   Preparation should begin as early possible. One year is strongly recommended. Successful methods include test preparation booklets, formal prep courses (Kaplan or Princeton Reviews), and organized study groups (with pre-med colleagues at S&T). Speak with the S&T Pre-Med advisor, Dr. Dave Westenberg for more information.

7. **How does one register for admissions tests?**
   
   Registration must be done on-line at [www.aamc.org/students/mcat](http://www.aamc.org/students/mcat). Costs vary for each test. The current cost for the MCAT is $210 with a $50 late fee. Regular registration closes about 5 weeks before the test date; late registration ends 3 weeks before. Computer based testing sites are limited so register as early as possible to get your desired test date.

8. **Anything else that should be completed before applying to professional schools?**
   
   Health profession schools are interested in students who have some exposure to their profession so the applicant knows what it is like to be a practicing health care professional today. This can come from volunteering in a hospital or nursing home; working as an orderly; obtaining an EMT license or shadowing a physician/veterinarian/dentist/pharmacist etc. for a few weeks. These expectations vary from profession to profession. For example, veterinary schools require a minimum of 100 shadowing hours but expect significantly more.

9. **How to request letters of recommendation?**
   
   For students applying to medical or dental school, the Pre-Health Professions Advisory Committee can provide a composite letter of recommendation based on an interview. This is actually the preferred option for most medical schools and replaces the need for multiple individual letters. Interviews are held in April and May, before the application process begins. For applications to other professional schools, select faculty or health care professionals who know you quite well and can vouch for your qualities that will make you a good health care professional. Ask for letters of recommendation at least one month in advance. Provide the recommender with your resume, unofficial transcripts and personal statement. Descriptions of other activities on campus or in the community is also helpful.

10. **How can a pre-health professions student stay "plugged in" to pre-health activities?**
    
    Join Scrubs (S&T's Pre-Med student organization) and get involved. Their website is [http://web.mst.edu/~scrubs](http://web.mst.edu/~scrubs)
    Check out the Scrubs website for news about pre-health profession activities such as speakers and visits to professional schools.
Completing the Medical School Application

Put down every college you attended—even dual-enrollment in high school. Include the dates you will be attending S&T (even if you won't graduate from S&T until the following May). They want the graduation date, not the time you have completed to this point. List all the classes you plan to take. This is not a contract and those plans can change but you should have an idea what courses you expect to be taking.

Recommendations are not needed until the secondary applications are requested. Check with the websites of the various medical schools to which you will be applying. They usually indicate how many recommendations are needed. Some have very specific requests—faculty advisor, professor in a science class, etc. Most will prefer to have a group recommendation from your pre-health committee if the university has one (and S&T has a pre-health committee).

You do not need to have admissions test scores to request an interview with the Pre-Health Advisory Committee. The committee’s goal is to prepare a letter that reflects your academic and community service activities in the context of what Missouri S&T has to offer. Are you taking a challenging curriculum? Is your level of involvement typical or above and beyond the typical S&T students. It is recommended to wait until after the interview to submit the application. The committee might have suggestions for strengthening your application.

Any member of the committee would be happy to read the “personal statement” section of the application. They do this quite often for applicants. You are also advised to speak with the Writing Center for advice and help with your statement before contacting a committee member.

If you intend to ask for early decision to UMC, you need to have your application submitted by August 1. The first regular deadline is usually in October or November for most medical schools. You should check the websites of the schools to which you intend to apply and see what they say. Don’t hesitate to contact an admissions counselor (like Mrs. Alison Martin at UMC); they are happy to answer your questions AND it gets your name on their radar.

There is a theory that says the earlier the better. If you apply in the summer, you will beat the rush!

Here are some S&T websites with information for Pre-Med students:

Miner Pre-Med Page - http://biosci.mst.edu/pre-professionalprograms/pre-med/
Scrub (S&T’s Pre-Health Club) - http://web.mst.edu/~scrubs/
Pre-Medicine Advisory Committee - http://biosci.mst.edu/pre-professionalprograms/pre-med-committee/

Pre-Medicine Advisory Committee

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Oliver Sutton  
143 Schrenk Hall  
x4426  
ocsm@mst.edu  
Merilee Krueger  
107 H-SS  
Ex 4937  
krueger@mst.edu
Pre-Medicine Application Essay Advice

As a general strategy, what you’re trying to do in the essays is the following:

Demonstrate your commitment to the field of medicine (and especially show that it's not just a momentary impulse or a desire to be rich and famous). How and when did you begin to be interested in medicine? How has your life up to this point demonstrated or nurtured that interest? (If you come from a family of doctors, of course you can talk about your observations of family members and how that has contributed to your commitment to the field, but you need to show that your interest is more than just a desire to emulate someone you admire.)

Show your prior experience with work in the medical community and related fields. This is a place to talk about volunteer service or paid employment in nursing homes, as an EMT, as a medical technician or orderly, as a nurse or nursing home aide, as a Red Cross or other first aid volunteer, as a home health aide, etc. If you've done any shadowing (observing a medical professional at work) include that, and explain how all these experiences have helped you become more certain of your commitment to the field of medicine. If you don't have any paid or volunteer experience and haven't spent any time shadowing, your first priority should be to go out and get some experience. Today.

Show that you have the "right stuff" to get through med school—essentially you need determination and the ability to overcome obstacles, high academic ability, problem-solving skills, the ability to think and act independently, and a willingness to put the rest of your life on hold for a few years while you make medicine your first (and to some extent only) priority. So in other words, well-roundedness is not as important as the ability to focus.

In the essay that asks you to talk about what your life will be like some years in the future, you're trying to show that you have a realistic and practical understanding of the medical profession and a fairly concrete sense of the direction you hope your own career will take—both what you will gain from it and what you will contribute by it.

Janet S. Zepernick
Missouri S&T
Overview
Rural background students are more likely to practice in rural areas when compared to their non-rural classmates. Students are pre-admitted during college in an effort to keep rural students in state for medical school and ultimately rural practice. Students are accepted into the Bryant Scholars Pre-Admissions Program as a cooperative effort between six designated Missouri institutions and the MU School of Medicine.

Students accepted into the pre-admissions program are offered acceptance into a particular entering class of the MU School of Medicine, conditional upon achieving certain academic standards, demonstrating ongoing professional conduct, and participating in required activities.

The Selection Process
Acceptance into the Bryant Scholars Program is based on high academic achievement, commitment to a career in rural medicine, personal characteristics expected of quality physicians, and a small-town or rural background. Students are eligible for admission to the program following completion of their sophomore year in college.

Minimum requirements:
- Composite score on the ACT examination of 28 or 1260 (CR+M) on the SAT
- High academic achievement during high school
- High academic achievement during the first two years of college. Applicants must have a minimum 3.30 cumulative GPA and a minimum 3.30 math/science GPA and no grade lower than a B in Core Science Courses (General Chemistry, Organic Chemistry and Biology).
- Evidence of leadership and interest in a variety of extracurricular activities
- Missouri residence
- Graduation from a rural Missouri high school as defined by the National Center for Education Statistics (NCES)
- Full-time enrollment at Missouri S&T.

Application materials for the program can be obtained from the Chair or the Pre-Medicine Advisory Committee or you can download the file from the Scrubs website (http://web.mst.edu/~scrubs/links.htm). Applications are due June 1. Required materials include:

Once your file is complete, your Bryant Scholars Program Advisor will evaluate your candidacy and then forward it to the MU School of Medicine, Office of Medical Education. A screening committee will review completed files. Members of the Preprofessional Scholars Programs Committee of the MU School of Medicine will conduct interviews in late July and select the Bryant Scholars.
**Bryant Rural Scholars Program for Pre-Med Students**

*(Continued)*

**Program Requirements**

Bryant Scholars must maintain a cumulative GPA of 3.30, a cumulative math/science GPA of 3.30, and earn A or B grades in the required courses specific to each participating institution.

Bryant Scholars are required to take the Medical College Admissions Test (MCAT) for matriculation into the MU School of Medicine. Students must achieve minimum MCAT scores set by the MU School of Medicine.

Bryant Scholars must also attend biannual retreats designed to assist with the transition to the school's problem-based learning curriculum and to promote discussion of topics relevant to rural medicine. Required retreats take place at the MU School of Medicine in Columbia. Students are required to attend three of four retreats, including all summer retreats.

Bryant Scholars are required to enter a mentoring relationship with a rural physician during their junior year in college. Students spend at least 20 hours a year with their mentor, job shadowing and devoting time to career guidance and professional development. Students are required to write two reflection papers annually about their shadowing experiences. Additionally, Bryant Scholars are required to log 20 hours of other health-related experiences and eight hours of community service per year.

**Rural Commitment**

Upon matriculation into the MU School of Medicine, Bryant Scholars are required to participate in the Summer Community Program, the Rural Track Clerkship Program and the Rural Track Elective Program. Bryant Scholars are required to complete six weeks of the Summer Community Program, three rural track clerkships, and one rural track elective during medical school. Students who successfully complete all medical school requirements of the Bryant Scholars Program will receive a Bryant Scholarship during their fourth year in medical school.

**Background**

**Enhancing the Physician Workforce in Rural Areas**

As the state's leading educator of physicians practicing in Missouri, the MU School of Medicine is in a key position to improve the supply and distribution of physicians in rural Missouri. Although it can't single-handedly solve Missouri's rural health physician shortage, the school does have unique capabilities to enhance the physician workforce.

In response to the challenge, Dean Lester R. Bryant requested the creation of the MU Area Health Education Center (MU AHEC) program office in 1994 to address the shortage of physicians in rural areas of the state. The MU Rural Track Pipeline Program was designed to encompass four distinct but related curriculum and clinical components. The sequential programs provide students with ongoing exposure to rural medicine.

**Program Components**

- Bryant Scholars Pre-Admissions Program
- Summer Community Program
- Rural Track Clerkship Program
- Rural Track Elective Program

**Outcomes**

Program participants are more likely to choose a primary care specialty and twice as likely to choose family medicine as their specialty when compared to non-participants.

57.4% of participants practice in a rural location.

90% of Bryant Scholars practice in Missouri.
Still Scholars Program for Pre-Osteopathic Students

Program Description

The Still Scholars, Pre-Osteopathic Program is designed to provide admission opportunities to outstanding students of Missouri University of Science and Technology (Missouri S&T) who have as their goal to become Doctors of Osteopathic Medicine. The program is conducted under joint collaboration of Missouri S&T and A.T. Still University (ATSU), Kirksville College of Osteopathic Medicine (KCOM).

Under this program, Missouri University of Science and Technology students apply to the Kirksville College of Osteopathic Medicine at the end of their sophomore year, or during their fourth semester as a residential Missouri S&T student, and must have been a residential Missouri S & T student for a minimum of three semesters. Students will be awarded reserved admissions to KCOM at the beginning of their junior year at Missouri S&T. Students must commit to completing their junior and senior years at Missouri S&T earning a BA/BS degree prior to matriculating to KCOM.

The advantage for those students accepted at the end of their sophomore year is to have a reserved seat in KCOM’s entering class upon graduation from Missouri S&T. The Medical College Admission Test (MCAT) is not required. After acceptance to the program, the student can spend the last two years at Missouri S&T meeting graduation major/minor requirements, taking electives, fulfilling internship and/or service opportunities, and otherwise broadening his/her life experiences. Scholars will be awarded an academic scholarship for A.T. Still University, Kirksville College of Osteopathic Medicine.

Program Requirements

Missouri S&T students may enroll in any major, provided the KCOM entry requirements are met by the designated year of enrollment. Missouri S&T students will apply for admissions to this program after completing three semesters (approximately 45 credit hours) as a Missouri S&T student. Applications will be available online in January of the sophomore year and will be due to the Missouri S&T Pre-Health Advisor on April 1. Applications of students selected for nomination by Missouri S&T must be submitted to the Kirksville College of Osteopathic Medicine by June 1. Applicants will interview during the summer following their sophomore year. Selected students will be awarded reserved admissions to KCOM at the beginning of the junior year. Eligibility criteria for this program include:

Applicant Criteria

Minimum 28 composite ACT score or 1860 SAT score
Minimum grade point average (GPA) of 3.40 overall and 3.40 in the sciences
Submission of application and official transcripts by specified date
Must have completed:
  Mathematics through College Algebra (Math 2 or 4), or beyond
  A full year of General Chemistry (Chem 1, 2, 3, and 4)
  Fundamentals of Biology with Lab (BioSc 111 and 112)
  One English class
Either completed or be currently enrolled in:
  Organic Chemistry I (Chem 221)
  Cell Biology with Lab (BioSc 211 and 212), or Microbiology with Lab (BioSc 221 and 222)
Still Scholars Program (continued)

Application Process

Submit application to the Missouri S&T Pre-Health Advisor by specified date
Applicants must forward a minimum of two letters of evaluation
   One must be from the Pre-Health Advisor and/or a science faculty member
   Additional letters may come from a Faculty Member, Staff member, or Employer

Selection Criteria

Selection committee will rank the top students using the following criteria:
   Fulfillment of all academic and course requirements
   Commitment to osteopathic medicine
   Community service/leadership positions held
   Successful interview with the KCOM selection committee

Participant Criteria

   Complete an Academic Degree Plan for the remaining two years at Missouri S&T
   Maintain a minimum 3.4 overall and science GPA
   Continue to gain clinical experience/exposure
   Continue community service/leadership opportunities
   Demonstrate commitment to osteopathic medicine
   Participate in KCOM Still Scholars Events
   Complete required coursework at Missouri S&T
   Earn BA/BS degree from Missouri S&T
   Maintain accurate contact information with ATSU Admissions
   Participate in KCOM final pre-matriculation review
   Complete AACOMAS application by July 1 prior to senior year
   Complete KCOM secondary application by August 1 prior to senior year
   Successfully complete prerequisite coursework at undergraduate institution

Participant Opportunities

   Academic Skills Workshop/Shadowing Experience
   Professionalism Workshop
   Alumni Ambassador Shadowing Experience

All prescribed courses in the baccalaureate program of the applicants’ choice must be taken at Missouri S&T. Any deviation from the required courses requires written approval from the Missouri S&T Pre-Health Advisor and from ATSU Admissions. Participants must complete graduation requirements for Missouri S&T in four years prior to matriculating to ATSU/KCOM. A.T. Still University, Kirksville College of Osteopathic Medicine reserves the right, at any time, to reject a student deemed unsuitable for the program. In addition, acceptance will be withdrawn if application is made to another medical/osteopathic school, or if academic, ethical, or moral violation occurs, or if a personal change in career choice is made.
Getting to Know Your Professors

By now, you’re well aware that there are many differences between class in high school and class in college. You’ve observed that your professors’ teaching styles and expectations are different than those of your high school teachers. More information about your professors and their jobs may help you to figure out how to better communicate with them.

Responsibilities of Professors

- Work 60-80 hours per week
- Spend 6-15 hours per week in the classroom
- Read to keep themselves current in their fields
- Prepare and revise lecture notes
- Grade tests and papers
- Conduct research
- Write articles for journals
- Prepare presentations for conferences
- Advise students
- Administrative duties (university committees, university projects, faculty senate, etc.)

Professors are people

- They have interests outside the subjects they are teaching
- They respond to the same types of verbal and nonverbal feedback as you

Most professors weren’t trained to teach

- Instead of education courses, they took courses in their academic discipline. These courses taught them how to acquire and understand new knowledge.
- In pursuing their degrees, they have developed skills that characterize successful students.

Information presented in class will be managed differently than it was in high school

- Professors may not spend much time in class teaching what’s in the textbook and they won’t base their test exclusively on the book. This doesn’t mean that they don’t consider that information important.
- They will share their perspectives on their disciplines and introduce outside resources.

In many classes you will be responsible for staying caught up. The professors won’t collect homework or regularly give quizzes.

They are interested in you

- They are required to keep office hours.
- Many professors will take a personal interest in you as a student and a person.

Why they chose college teaching

- The hours are long, the pay is fair and the frustrations are many.
- Many professors love their disciplines and find it rewarding to uncover new ideas.

How to make the most of the student-professor relationship

- Go to class.
- Be on time and prepared for class. Always bring your notebook and textbook to class (unless your professor specifically says you will not need the text during lectures).
- Sit near the front of the class.
- Ask questions
- Be interested
- Never talk or whisper while the professor is talking
- If an emergency arises and you must miss class, get the notes from someone else. In the class following your absence, tell the professor you’ve gotten the notes but wanted to make sure that you did not miss any announcements for upcoming test, etc. Don’t dwell on the reason for your absence, the professor has probably heard it all before.
- Turn assignments in on time
- Be courteous
- The purpose of meeting with a professor during office hours is to enhance your understanding of the class. Before an appointment with a professor you should
  - Preview the text to familiarize yourself with the topics for the remainder of the course.
  - Review your notes and identify topics you don’t understand
  - Write down at least three or four good questions about the course such as potential topics for projects, questions about the most effective way to study material, etc.
- Know where the professors’ office is so you won’t be late
- Make sure you know the professors’ title and can pronounce his or her last name
- Never miss an appointment. If an emergency comes up, call to reschedule with plenty of advance notice.
Ten Tips for Successful Students

Go to class!
Read the course syllabus (outline).
Read the assignments before the lecture.
Take notes in class.
Review notes from class.
Hand in assignments on time.
Ask questions!
Ask for help early.
Quiz yourself over notes and reading assignments.
Study every day.

Ten More Tips for Academic Success

Know when and where to get help!
Balance!! There is nothing wrong with taking a fun class to give yourself a break from your technical classes.
This is not High School! It is almost impossible to take seven hours of class in a row...but at the same time don’t schedule only one class for a particular day.
Be aware, with your advisor’s help, of your limitation.
Don’t miss your registration time.
Know the various ways to register for classes.
When planning your schedule, first plan around the classes that are only offered once.
Learn what is expected in each class. Don’t take too many reading intensive classes at once.
Plan ahead a couple semesters. This way those prerequisites that they only offer every other year do not delay your graduation.
Know your advisor by name and stop by regularly.
Advice from Present Students

♦ Expect challenges. Get involved and get experience. Nothing is too big for you to achieve.
♦ Understand chemistry…biology is its greatest application.
♦ Memorize photosynthesis - then you’re guaranteed >30% in all your classes.
♦ Take what people say about professors with a grain of salt. Everyone has their own learning styles, and a professor some people hate, may be one you love.
♦ Don’t be afraid to ask older students for help. Get to know them and ask for advice on what classes to take when, or if they have a file you could borrow for one of your current classes.
♦ Classes and studying are the most important aspects of college; however, it is good to become involved on campus.
♦ Become active. Join a few clubs that seem interesting to you.
♦ STUDY, STUDY, STUDY.
♦ Form study groups; they can be very helpful.
♦ Find a professor you like and try to do research with them.
♦ Just because the course is easy, it doesn’t mean you can slack off.
♦ Only use solution manuals to check your answers or to help explain problems. If you copy the answers, you will quickly be lost in class.
♦ Start studying before the semester begins.
♦ Some courses in high school seemed really easy, and I didn’t have to study very much, but in college I’ve had to learn better study habits.
♦ Practice, practice (especially for organic chemistry)
♦ Make sure to find a quiet place to study for your harder classes.
♦ Get involved in research.
♦ Don’t be afraid to ask your professors questions if you don’t understand something; most are happy to help.
♦ Make a To-do list; make a schedule - classes, study time, etc
♦ Anatomy and Physiology - review your notes daily, study as you go and keep up on your reading.

Biology Student Study Lounge

Individual or group study sessions are invited to use the student study lounge, room 106 in Schrenk Hall. The lounge is open between 6:00 am and midnight and is equipped with several seating arrangements, tables, a laptop computer, a small kitchenette, a refrigerator and two microwave ovens, filtered water at the sink and hot and cold water in the cooler. Flyers may be posted on the bulletin board.

Students may use the kitchen facilities and are reminded to maintain the area and clean up after yourselves. Notify the office staff if there are any problems that need repair or service.
**Problems**

**Personal:** If you encounter personal problems while at S&T, the S&T Counseling Center can help. The Counseling Center’s staff members are committed to student learning and success, as well as to serving the S&T community. The Counseling Center services include individual, group, and crisis counseling; programming; consultation; referral information; and self-help materials to the S&T community. Services provided by the Counseling Center are free to full-time S&T students, faculty, and staff. Part-time students, faculty, and staff may receive consultation, limited services, or community referral. (If you have a question about eligibility, please contact their office at 341-4211.) Services are provided by professionally-trained counselors and psychologists and are confidential within legal limitations and professional guidelines. Support staff are also well-trained to meet the needs of the campus within their roles in the Center. Appointments are made by contacting Erma Brand at 341-4211 or by stopping by the Counseling Center office, which is located on the second floor of Norwood Hall (Room #204). Appointments usually last 50 minutes. If your situation is a crisis and it is during regular hours, please call the Counseling Center or come by their office. They will make sure you are seen as soon as possible that day. For psychological emergencies that occur when the office is closed, they can be contacted through the S&T Police at 341-4300.

**Academic:** If you encounter a problem with a faculty member or graduate student, please contact the department chair, Dr. Robert Aronstam (aronstam@mst.edu). If you are struggling in a class, speak to your instructor about the availability of tutoring or other alternatives. The Counseling Center and the S&T Testing center may also provide services to help with improving your study and test taking skills. Assistance for some courses is also available through the Learning Enhancement Across Disciplines (LEAD) program (http://lead.mst.edu/).

**Academic Dishonesty:** [http://registrar.mst.edu/academicregs/](http://registrar.mst.edu/academicregs/) Page 30 of the S&T Student Academic Regulations handbook describes the student standard of conduct relative to the System’s Collected Rules and Regulations section 200.010, and offers descriptions of academic dishonesty including cheating, plagiarism or sabotage. Additional guidance for faculty, including a description of the process for dealing with issues related to academic dishonesty, is available on-line at [http://ugs.mst.edu/](http://ugs.mst.edu/).

**Discrimination and Sexual Harassment:** S&T has a policy against race, or gender discrimination and sexual harassment, and considers these kinds of behaviors intolerable and unacceptable. Should you encounter any form of discrimination or harassment, please contact Dr. Robert Aronstam.

**Academic Alert System:** [http://academicalert.mst.edu/](http://academicalert.mst.edu/) All faculty are encouraged to utilize the online Academic Alert System. The purpose of the Academic Alert System is to improve the overall academic success of students by improving communication among students, instructors and advisors; reducing the time required for students to be informed of their academic status; and informing students of actions necessary by them in order to meet the academic requirements in their courses.

**Disability Support Services:** [http://counsel.mst.edu/](http://counsel.mst.edu/) Any student inquiring about academic accommodations because of a disability should be referred to Disability Support Services so that appropriate and reasonable accommodative services can be determined and recommended. Disability Support Services is located in 204 Norwood Hall. Their phone number is 341-4211 and their email is dss@mst.edu. Instructors may consider including the following statement on their course syllabus as a means of informing students about the services offered:

“If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with me early in the semester. You will need to request that the Disability Services staff send a letter to me verifying your disability and specifying the accommodation you will need before I can arrange your accommodation.”
# Important Contacts

<table>
<thead>
<tr>
<th>Name</th>
<th>Office</th>
<th>Phone</th>
<th>E-mail</th>
<th>Website</th>
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<tbody>
<tr>
<td><strong>S&amp;T Campus Support Services</strong></td>
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<tr>
<td>BioSci Office</td>
<td>105 Schrenk</td>
<td>4831</td>
<td><a href="mailto:biosci@mst.edu">biosci@mst.edu</a></td>
<td>biosci.mst.edu</td>
</tr>
<tr>
<td>Academic Affairs</td>
<td>110 ERL</td>
<td>7887</td>
<td><a href="mailto:vpaa@mst.edu">vpaa@mst.edu</a></td>
<td>ugs.mst.edu/</td>
</tr>
<tr>
<td>Academic Support</td>
<td>203 Norwood</td>
<td>6665</td>
<td><a href="mailto:lead@mst.edu">lead@mst.edu</a></td>
<td>learn.mst.edu</td>
</tr>
<tr>
<td>Career Opportunities Center</td>
<td>303 Norwood</td>
<td>4343</td>
<td><a href="mailto:career@mst.edu">career@mst.edu</a></td>
<td>career.mst.edu</td>
</tr>
<tr>
<td>Cashier’s Office</td>
<td>G-4 Parker</td>
<td>4195</td>
<td><a href="mailto:cashier@mst.edu">cashier@mst.edu</a></td>
<td>cashier.mst.edu</td>
</tr>
<tr>
<td>Computing Help Desk</td>
<td>104 Comp Sci</td>
<td>4357</td>
<td><a href="mailto:help@mst.edu">help@mst.edu</a></td>
<td>helpdesk.mst.edu</td>
</tr>
<tr>
<td>Counseling Center</td>
<td>204 Norwood</td>
<td>4211</td>
<td><a href="mailto:counsel@mst.edu">counsel@mst.edu</a></td>
<td>counsel.mst.edu</td>
</tr>
<tr>
<td>Financial Assistance</td>
<td>G-1 Parker</td>
<td>4282</td>
<td><a href="mailto:SFA@mst.edu">SFA@mst.edu</a></td>
<td>sfa.mst.edu</td>
</tr>
<tr>
<td>Human Resources</td>
<td>113 University Ctr</td>
<td>4241</td>
<td><a href="mailto:hrsinfo@mst.edu">hrsinfo@mst.edu</a></td>
<td>hr.mst.edu</td>
</tr>
<tr>
<td>International Affairs</td>
<td>103 Norwood</td>
<td>4208</td>
<td><a href="mailto:ia@mst.edu">ia@mst.edu</a></td>
<td>international.mst.edu</td>
</tr>
<tr>
<td>LEAD Peer Tutoring</td>
<td>203 Norwood</td>
<td>6665</td>
<td><a href="mailto:lead@mst.edu">lead@mst.edu</a></td>
<td><a href="mailto:lead@mst.edu">lead@mst.edu</a></td>
</tr>
<tr>
<td>Library</td>
<td>Curtis Laws Wilson Library</td>
<td>4227</td>
<td><a href="mailto:library@mst.edu">library@mst.edu</a></td>
<td><a href="mailto:library@mst.edu">library@mst.edu</a></td>
</tr>
<tr>
<td>Police</td>
<td>121 General Svcs</td>
<td>4300</td>
<td><a href="mailto:police@mst.edu">police@mst.edu</a></td>
<td><a href="mailto:police@mst.edu">police@mst.edu</a></td>
</tr>
<tr>
<td>Registrar</td>
<td>103 Parker</td>
<td>4181</td>
<td><a href="mailto:registrar@mst.edu">registrar@mst.edu</a></td>
<td><a href="mailto:registrar@mst.edu">registrar@mst.edu</a></td>
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<tr>
<td>Residential Life</td>
<td>107 Norwood</td>
<td>4218</td>
<td><a href="mailto:reslife@mst.edu">reslife@mst.edu</a></td>
<td>reslife.mst.edu</td>
</tr>
<tr>
<td>Student Health Services</td>
<td>1200 N. Pine St.</td>
<td>4284</td>
<td><a href="mailto:mstshs@mst.edu">mstshs@mst.edu</a></td>
<td>Studenthealth.mst.edu</td>
</tr>
<tr>
<td>Testing Center</td>
<td>203D Norwood</td>
<td>4222</td>
<td><a href="mailto:testctr@mst.edu">testctr@mst.edu</a></td>
<td>testcenter.mst.edu</td>
</tr>
<tr>
<td>Undergraduate Studies</td>
<td>209 Norwood Hall</td>
<td>7276</td>
<td><a href="mailto:ugs@mst.edu">ugs@mst.edu</a></td>
<td>ugs.mst.edu</td>
</tr>
<tr>
<td>Wellness Programs</td>
<td>1200 N. Pine St.</td>
<td>4284</td>
<td><a href="mailto:mstshs@mst.edu">mstshs@mst.edu</a></td>
<td>studenthealth.mst.edu/wellness/index</td>
</tr>
<tr>
<td>Writing Center</td>
<td>113 Campus Support</td>
<td>4436</td>
<td><a href="mailto:wac@mst.edu">wac@mst.edu</a></td>
<td>Writingcenter.mst.edu</td>
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To reach campus phone numbers from off-campus, add the prefix 341

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<thead>
<tr>
<th>Community Support Services</th>
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<tr>
<td>Alcoholics Anonymous</td>
<td></td>
<td>659-6670</td>
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<tr>
<td>Area Health Education Center</td>
<td>1101 Duane Ave</td>
<td>364-4797</td>
<td></td>
<td><a href="http://www.midmoahec.org/">www.midmoahec.org/</a></td>
</tr>
<tr>
<td>Pathways Community Behavioral</td>
<td></td>
<td>36407551</td>
<td></td>
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<tr>
<td>Phelps County Regional Hospital</td>
<td>1000 W. 10th St.</td>
<td>458-8899</td>
<td></td>
<td><a href="http://www.pcrmc.com/">www.pcrmc.com/</a></td>
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<tr>
<td>Planned Parenthood</td>
<td></td>
<td>364-1509</td>
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<tr>
<td>Poison Control</td>
<td></td>
<td>800-366-8888</td>
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<tr>
<td>Russell House</td>
<td></td>
<td>364-0222</td>
<td></td>
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<tr>
<td>Suicide Hotline</td>
<td></td>
<td>800-395-2132</td>
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