

**DEPARTMENT OF BIOLOGICAL SCIENCES
IDAHO STATE UNIVERSITY**

**A guide for students interested in selecting a major in the biological
sciences**

**Why biology and which major?
And
Answers to other common questions**

Section 1: COMMONLY ASKED QUESTIONS

- 1) Where is the Department of Biological Sciences, or the Biology Department?
- 2) Why are there so many majors?
- 3) Which biology major is right for me?
- 4) Isn't there a 'Pre-med', 'Pre-dent', or 'Pre-vet' major?
- 5) Isn't there an Environmental Studies major?
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- 13) What are some helpful hints for successful students?

1. Where is the Department of Biological Sciences or the Biology Department?

The **Department of Biological Sciences** is located in the Life Sciences Building (Building 65). Our department encompasses all of the disciplines in the biological sciences represented at ISU such as zoology, botany, ecology, microbiology, biochemistry and others. The department is named the Department of Biological Sciences instead of the Department of Biology because it encompasses essentially all of the disciplines in biology offered at ISU.

2. Why are there so many majors?

Biology can be defined as the study of living organisms and the processes that make life possible. However, this definition can be misleading in its simplicity. Biologists study organisms from the molecular through the ecosystem levels. They seek to understand the characteristics of organisms and their interactions with other organisms and their environments. Biologists use knowledge gained to address a wide variety of important problems. Each of the majors in the Department of Biological Sciences allows students to develop expertise in a specific area.

3. Which of the majors in the biological sciences is right for me?

All majors represent some degree of specialization within the biological sciences. The following discussion may help you better understand the diversity within the biological sciences and appreciate the similarities and differences between the majors.

Life is organized at different levels such as molecules, cells, organs, organisms, populations, communities, and ecosystems. Which level of organization interests you most? While you can learn about cell, organ, and organism levels of organization in some majors such as zoology, botany, biology; other majors place a stronger emphasis on the molecular level such as

microbiology and biochemistry, or on populations and ecosystems such as ecology. Of course, the botany major emphasizes plants, the zoology major emphasizes animals, and microbiology emphasizes microorganisms. Within some majors, it is possible to concentrate on anatomy, physiology, or evolution.

Research in our department is done in all areas represented by the undergraduate majors. Do you enjoy biology more for the pursuit of new knowledge or for the application of that knowledge to health care or environmental/conservation issues?

Some majors (e.g. Clinical Laboratory Sciences) prepare students for specific careers. However, with appropriate course selection and planning, any of the other majors offered in the biological sciences can prepare students either for careers or for post-graduate studies. Careers as technicians, as employees of agencies such as the BLM, Fish and Game, or the Forest Service, or as sales representatives for pharmaceutical or other technical companies are possibilities.

4. Isn't there a 'Pre-med', 'Pre-dent', or 'Pre-vet' major?

Pre-medicine is not a major at ISU, or most other universities. However, ISU has a strong pre-health professions advisement program. Students who intend to pursue careers in medicine, dentistry, veterinary medicine, physical therapy, occupational therapy, physician assistant, or other professional programs must select a major, and are encouraged to choose one that interests them whether that major is in the biological sciences, physical sciences, social sciences, pharmacy, or the humanities.

Pre-health Professions students are encouraged to contact the Office of Pre-Health Professions Advisement in the Life Sciences Building (Building 65). Specific information about the pre-health professions and academic advisement are arranged through this office. Students planning to pursue the health professions, in general, must complete specific prerequisite courses and an undergraduate degree. It is important to see an academic advisor early.

5. Isn't there an Environmental Studies major?

There is no environmental studies major, at the undergraduate level, at Idaho State University. Students interested in environmental studies can prepare to enter the Waste Management and Environmental Sciences Master's Degree Program. Within the framework of the basic degree requirements, an advisory committee is chosen to work with the student to create an individualized program of study. The student can combine courses in Waste Management and Environmental Science with related courses in areas of primary interest. Students interested in Environmental Studies can develop a strong undergraduate background by pursuing a degree in their primary area of interest. The primary area of interest could be, for example, either Ecology or Microbiology.

6. When should I declare a major?

You are required to select a major by the time you have completed 58 credits. You should declare your major as soon as possible and make sure you have an academic advisor assigned to you.

The clerical staff in the Department of Biological Sciences Office can help you by assigning an academic advisor who has expertise in an area of interest to you. Your academic advisor can provide you with information that will help you select a major.

If you plan to pursue a teaching career, you are encouraged to contact an academic advisor in the Department of Biological Sciences to discuss the options available to you.

Selecting a major is not irreversible. If you change your mind and wish to pursue a different major, a change can be made. Making a final decision on a major can require time for careful thought about yourself and your options. Insights gained in classes can often influence your plans. For some students, one class, one professor, or one lecture can bring their plans into focus, while other students may need longer to clarify their interests. Students should begin to explore career opportunities as they are selecting a major.

Changing majors is common among college students and occurs as they gain a better understanding of their interests and capabilities. Many students who think they “know for sure” what they want to do, change their minds during their first year or two in college.

7. What is the function of academic advisors and why should I have one assigned to me?

The purpose of academic advisors is to help students. Students should meet with an academic advisor each semester. Advisors make recommendations to students about the courses students should take each semester. Discussions between students and their advisors often help students save time and complete their degrees more quickly. In addition to the selection of courses, academic advisors can help students select appropriate majors, and choose useful elective courses. When students are having academic difficulty, academic advisors often make useful suggestions or direct students to resources designed to help them. Academic advisors can frequently help students begin an undergraduate research program or direct them to programs designed to help find employment opportunities after they graduate. Frequently, advisors can make recommendations to students that help them choose career options that they might not have otherwise considered.

Academic advisors often help students solve problems, or direct them to resources which help students. Rarely is the interaction with an advisor painful for students.

To have an advisor assigned to you, please see the clerical staff in the Department of Biological Sciences Office. Academic advisors with expertise in your area of interest will be assigned to you.

8. Curricula

The curricula for degrees in the Department of Biological Sciences have been changed. Students, either first year or transfer students, enrolling in ISU **beginning Fall 2003** are required to satisfy the current degree requirements. Students who have been attending ISU have the option of satisfying the previous requirements or the current requirements. However, they must all of the previous or current requirements. It is not an option to select some requirements from the previous curriculum and some from the current requirements. Both the previous and current requirements are posted on the Department of Biological Sciences home page (<http://www.isu.edu/departments/bios/undergraduate.htm>).

It is very important for you to meet with your advisor every semester to make sure you are selecting the appropriate courses. An advising table is available for approximately one week prior and during registration. The purpose of the table is to make the advising process easier for students.

9. Should I go to graduate school?

Consult with your academic advisor or other faculty. They can provide you with important advice on career selection and with recommendations about graduate school. Some careers require graduate degrees, including many professional programs (e.g. medical school, dental school, physical therapy school, occupational therapy school, etc.), research careers, or teaching careers in institutions of higher education. Some careers do not require advanced training, but people with graduate degrees may have an advantage in obtaining jobs. If you enjoy investigations, research, and acquiring new knowledge, you should consider going to graduate school.

10. How do I get involved in research?

Getting hands-on research experience while you are an undergraduate can give you a chance to learn about an area of biology in more depth than is possible in the standard classroom experience. It can help you make decisions about your future career and make you a more competitive candidate for graduate schools, jobs, or professional schools.

There are many opportunities for undergraduates to get involved in research on this campus. To explore research opportunities, it is a good idea to review the areas of research expertise of the faculty. A brief description of research expertise is available on the department home page (<http://www.isu.edu/departments/bios/faculty.htm>). Discussing possible research advisors with your academic advisor is a good way to explore research possibilities. Once you have identified a research area in which you are interested, make an appointment to talk with the faculty member who is conducting that type of research. Feel free to explain that you wish to participate in an undergraduate research experience. Students can earn academic credit for participating in undergraduate research. Students are strongly encouraged to write an undergraduate thesis. In some cases, the research effort may result in a summer job or a part-time job during the year in a research laboratory.

There are very few experiences more valuable to students than participation in undergraduate research. Students are strongly encouraged to get involved.

11. Will there be job opportunities for me after I graduate?

Students are likely to have job opportunities after they graduate, and it is possible for students to prepare for specific jobs. However, it is very important to prepare yourself, especially if you plan to apply for jobs with a B.S. or B.A. degree. Opportunities will be fewer if students do not plan for a career. Maximizing the opportunities for good jobs requires more than simply selecting a major and completing all of the listed requirements for graduation.

Some majors prepare students to go to work immediately following graduation more readily than others. Several majors can be enhanced in a way that will allow students to go successfully apply for jobs following graduation, while some majors are best adapted to help students pursue post-graduate studies. In all cases it is important for students to think about careers and to begin gathering information about careers as early as possible.

Microbiology, Clinical Laboratory Sciences, and Ecology are majors that prepare students to go to work immediately following graduation. Of course it may be more difficult to find a position in some areas than in others. In all instances, the courses and other experiences in which students choose to become involved can influence their abilities to compete for jobs. Students majoring in Biology may be prepared to apply for jobs, but the selection of elective courses and other

experiences will dramatically influence how competitive they are in the job market. For example, Biology Majors who earn teaching credentials and excel in their studies are often very competitive for teaching positions. The Biology major maximizes the number of you can take, but unless students pay attention to emphasizing some aspect of the biological sciences to make that degree attractive to employers, it may not be easy to find a job. Students may wish to emphasize natural history courses that will make them attractive to some agencies, and other biology majors may wish to emphasize physiology, or molecular biology, and business courses to make them more attractive to pharmaceutical or technical companies. Majors such as the Biochemistry, Zoology and Botany Degrees were developed with an emphasis on preparing students for further study in specific graduate or professional programs. For most students, they are stronger degrees than the B.S. in Biology. These strong basic degrees can, with appropriate planning, provide students with backgrounds that make them very competitive for good jobs (see examples listed below).

All students are strongly encouraged to discuss the selection of a major with their academic advisors. It is also valuable for students to explore the types of careers that are available for students who graduate with degrees in the biological sciences. A good place to begin exploring career opportunities is the Career Development Center (282-2380). A discussion with a career counselor can be very useful even early in a student's academic experience.

A number of websites provide information about jobs for graduates in the biological sciences:

<http://www.isu.edu/departments/career/majors/default.html>

<http://www.stuaff.niu.edu/cppc/major/Biology.htm>

http://www.oswego.edu/other_campus/student.svcs/career_svcs/resources/career_booklets/booklets.html

<http://www.usajobs.opm.gov/a1.htm> (Federal Job Website called USAJOBS)

<http://wfscnet.tamu.edu/wfscnet/Jobs/Jobs.htm> (for wildlife)

www.sciencejobs.com

<http://alpha.furman.edu/~snyder/careers/careerlist.html>

<http://alpha.furman.edu/%7Esnyder/careers/careerlist.html>

The following is more specific information that may be helpful to students who are anticipating careers in the some area of the Biological Sciences:

General:

Students with B.S. or M.S. degrees may find positions as technicians. Some of which are available in academic institutions.

Microbiology, cell biology, or molecular biology:

Website for Amer. Soc. of Microbiology: <http://www.asmta.org/edusrc/edu21.htm>

Positions in industry, government agencies, academic institutions, and the military research or production.

Salary ranges:

B.S. \$21, 000 to \$30,000 depending on the area of the country

M.S. \$30,000 to \$55,000 depending on the area of the country

Most positions will be in other areas of the country.

Valuable Background:

Molecular Biology (genetics, cell biology, advanced biology laboratories Chemistry (general, organic, biochemistry, physical chemistry, analytical chemistry)

Undergraduate research experience is highly beneficial

Website:

This website is for the US Dept of Labor. It has great, up to date, information and statistics. It also has well founded projections based on current economic trends

<http://stats.bls.gov/emp/home.htm>

Applied Biosystems (advertized in Science), Foster City, CA.

Salaries range from \$17-\$25/hr. Please see their website:

<http://www.appliedbiosystems.com>

[Click Careers in the lower left of the first page. Click Job Search in the left column on the second page. Click the arrow on the Location bar to look for available positions at the various company sites. Click Job Search for position list. Each position is hot linked to specifics about the position. You can also click the arrow on the Job Functions bar, but it generates very few of the positions listed in the Location list (I don't know why).]

Example of a position as a technician in the MRCF at ISU that was available last year. Salary approximately \$12.00/hour.

Clinical laboratory Sciences or Medical Technology

Students who graduate with certification in clinical laboratory sciences or medical technology generally have numerous job opportunities. Virtually all of the graduates of ISU's programs have had job offers. The salary ranges depend on the area and the position type but the beginning salary range is approximately \$30,000 to \$40,000.

Ecology

Agencies that offer positions for which ecologists are trained include:

Fish and wildlife agencies such as Idaho Department of Fish and Game or Washington Department of Fish and Wildlife

Resource management agencies like DEQ, BLM, and BOR. Non-government groups like The Nature Conservancy, Trust For Public Lands etc.

Students should expect to be mobile to find a job.

BS graduates are likely to earn \$25,000 to \$30,000 per year

MS grauates are likely to earn \$35,000 to \$40,000 per year.

(See list of specific job opportunities below)

Students who are skilled at identifying plants, have taken Plant Ecology, have field experience using some instrumentation, and have had statistics, and can write a report can expect to get a job.

Salary ranges are approximately \$20,000 in Idaho and my approach \$30,000. Some faculty have received phone calls from employers in Idaho looking for such people. Students with the skills listed above and who have courses in environmental chemistry, soil physics, or some engineering have even more opportunities and may start at a salary of \$40,000 or higher

Botany

It is very helpful to talk with botanists in the Department of Biological Sciences.

Agencies such as the US Forest Service and EPA employ some botanists.

USFS has hired more people lately and wants expertise (or experience in) plant taxonomy.

Most positions are in other areas of the country (e.g. California or the midwest). Local positions tend to require background in plant systematics including knowledge of local flora

Recommended background:

plant physiology, plant systematics, possibly plant anatomy. Microbiology is useful. GIS experience is important for federal positions. Chemistry is always helpful and when combined with biology can qualify one for jobs in DEQ or EPA. Advanced Experimental Biochem is useful for technician jobs.

If you want to go to graduate school or really get a job in laboratories using plants, you have to have background in molecular biology

Examples of positions taken by recent ISU graduates:

US Army, DEQ, Shoban Tribes, INEEL

Salary ranges:

Generally: \$20,000 to \$30,000

With background in molecular biology: \$30,000 to \$40,000

Websites:

Botanical Society of America has good information on careers:

<http://www.botany.org/bsa/careers/>

Environmental Sciences/ Hazardous Waste Management

ISU has close to 100% placement of graduates in this area

Employers have been INEEL, AMIs, Simplot, cities and counties, and other federal agencies.

Beginning salaries are in the range of \$30,000 to \$60,000

There are numerous job opportunities if one is willing to leave the area

Examples of some specific positions:

The following are examples of standard Federal Agency jobs available to our graduating ecologists, zoologists, and biologists. This is a sample of the scores of wildlife related jobs currently posted on the federal job board.

Graduating B.S

BIOLOGICAL SCIENCE TECHNICIAN (WILDLIFE)
\$24,701 - 35,796 GS-0404-05/06 Oct 15, 2002
USDA, FOREST SERVICE NC-DEMO-02-34
Open to Everyone, Full Time, Term appt, NTE 1 yr
Rhineland, WI

BIOLOGICAL SCIENCE TECHNICIAN (WILDLIFE)
\$25,384 GS-0404-05/ Oct 11, 2002
INTERIOR, U.S. FISH AND WILDLIFE SERVICE
TVA-02-118
Open to Everyone, Full Time, Temporary RIDGEFIELD, WA

BIOLOGICAL SCIENCE TECHNICIAN (WILDLIFE)
\$24,701 - 39,779 GS-0404-05/07

Graduating M.S. with no prior federal experience

BIOLOGIST, FISH AND WILDLIFE
\$37,428 - 45,285 GS-0401-09/11 Oct 25, 2002
INTERIOR, U.S. Fish and Wildlife Service FS155859 NMH
Open to Everyone, Full Time, Permanent SALMON, ID

FISH & WILDLIFE BIOLOGIST
\$32,684 - 48,374 GS-0401-07/11 INDEFINITE
INTERIOR, U.S. Fish and Wildlife Service FS138804 NMH
Open to Everyone, Full Time, Permanent
VENTURA, CA; BARSTOW, CA

FISH AND WILDLIFE BIOLOGIST
\$45,285 - 58,867 GS-0401-11/ Oct 22, 2002
INTERIOR, U.S. FISH AND WILDLIFE SERVICE DEU4-03-001
Open to Everyone, Full Time, Permanent ATHENS, GA

RESEARCH WILDLIFE BIOLOGIST
\$34,451 - 44,783 GS-0486-09/09 Oct 18, 2002
INTERIOR, Geological Survey USGS-W-02-0389
Open to Everyone, Full Time, Permanent Anchorage, AK

WILDLIFE BIOLOGIST
\$37,428 - 48,652 GS-0486-09/ Oct 17, 2002
USDA, FOREST SERVICE SNF-DEMO-02-37
Open to Everyone, Full Time, Permanent

Graduating Ph.D. with no prior federal experience

FISH & WILDLIFE BIOLOGIST
\$55,694 - 86,095 GS-0401-12/13 Oct 29, 2002
INTERIOR, U.S. FISH AND WILDLIFE SERVICE FWS9-02-152
Open to Everyone, Full Time, Permanent ARLINGTON, VA

FISH & WILDLIFE BIOLOGIST
\$55,774 - 55,774 GS-0401-12/12 Oct 15, 2002
INTERIOR, U.S. Fish and Wildlife Service FS155697 DEA
Open to Everyone, Full Time, Permanent PORTLAND, OR

FISH AND WILDLIFE BIOLOGIST
\$54,825 - 71,270 GS-0401-12/13 Oct 23, 2002
INTERIOR, U.S. FISH AND WILDLIFE SERVICE DEU4-02-165
Open to Everyone, Full Time, Permanent Atlanta, GA

FISH AND WILDLIFE BIOLOGIST
\$46,732 - 72,809 GS-0401-11/12 Oct 28, 2002

INTERIOR, U.S. FISH AND WILDLIFE SERVICE FWS5-02-128
Open to Everyone, Full Time, Permanent

RESEARCH FISHERIES BIOLOGIST OR WILDLIFE BIOLOGIST
\$55,839 - 72,588 GS-0482-12/ Nov 9, 2002
COMMERCE, Nat Oceanic and Atmospheric Admin
W.NMF.NWC.020030007A.JC
Open to Everyone, Full Time, Permanent Seattle, WA

INTERIOR, BUREAU OF LAND MANAGEMENT
BLM/OI-03-001CVA
Open to Everyone, Full Time, Term appt, NTE 4 yrs
MEDFORD, OR; GRANTS PASS , OR

BIOLOGICAL SCIENCE TECHNICIAN (WILDLIFE)
\$29,412 - 38,237 GS-0404-06/ Oct 18, 2002
INTERIOR, NATIONAL PARK SERVICE JOTR-DEU-02-07
Open to Everyone
Full Time, Term appt, NTE 1 yr Twentynine Palms, CA

12. What should I take, and when?

Most majors within the biological sciences have very similar requirements with respect to math, chemistry, physics, and introductory courses in the biological sciences. Selecting an appropriate sequence is very important. Making poorly informed decisions can increase the number of semesters required to earn a degree.

You do not need to worry about locking yourself into a specific major. If you select appropriate beginning courses for one major in the biological sciences, the courses will probably be adequate for the other majors.

It is important to take math courses and chemistry courses as soon as possible. If possible, students should take general chemistry (CHEM 111 and 112) during their freshman year, especially if they plan to major in Biochemistry, Microbiology, and Medical Technology.

You should select courses that will maximize your understanding of the discipline in which you are most interested and which will best prepare you for your chosen career. Taking the most rigorous course for which you are prepared maximizes your options for an undergraduate major, career choices, and postgraduate studies.

13. What are some helpful hints for successful students?

1. Take advantage of outside of class opportunities such as the following:
 - a. Join the microbiology club or the Pre-Health Professions Student Organization.
 - b. Volunteer on a research project in the labor or in the field
 - c. Volunteer for opportunities that might interest you (e.g. Idaho Fish and Game, veterinarians, and some health care providers frequently have volunteer positions).
2. Plan on studying a minimum of 2 hours for every hour you spend in class.
3. Turn off the TV and music while you are studying.
4. Attend departmental seminars!
5. Don't be shy; talk to your academic advisor.
6. Many classes such as math, chemistry, physics, and some biology classes have assigned homework problems. Work on those problems as soon as they are assigned and make sure you can solve them. If you have trouble with the problems, seek help as soon as possible.
7. If you are having difficulty in a class, ask for help as early as you can. You may wish to take one of the study skills offered to students.

Section 2: ADVISEMENT INFORMATION

The following information is designed to help you understand what you need to take. You should discuss this information with your advisor. It provides important basic advisement information and it addresses many common questions for students majoring in the biological sciences.

A. Total credits required for graduation:

- All students who graduate with a BS or BA from ISU must earn at least 128 credits. Of course, those credits must be the correct credits.
- Included in the required 128 credits, students must satisfy:
 1. The general education requirements (note the difference for the BS and BA degrees)
 2. The departmental requirements (each major has a list of specific requirements for graduation).
 3. Complete at least 36 upper division credits (300-400). At least 16 upper division credits must be taken in the department in which the student is majoring.

Summary: To earn a BS or BA Degree you must complete:

1. 128 credits
2. General Ed. Requirements
3. Departmental Requirements
4. 36 upper division credits (16 in Dept.)

B. Load:

- To graduate in 4 years (8 semesters) students must average 16 credits per semester.
- The normal load from 12 to 18 credits. For financial aid purposes, a 12-credit load is the minimum required for full-time status. Students who take 8 credits or more are considered to be full-time students for other purposes (e.g. Tuition, etc.).
- How many credits can be handled in a single semester?

Rough calculation for typical students:

Academic credits	Hours/ week			
	Class hours	Study hours	Work hours	Total
12	12	24	20	56
14	14	28	20	62
16	16	32	20	68
18	18	36	20	74

- Students are not allowed to take more than 18 credits without permission from the Dean's office. The Dean's office will not provide permission without advice from the department. The department occasionally recommends that students be given permission to take more than 18 credits, but only when there is evidence that the student will be successful, and when there is a compelling need. A memo from the student's advisor to the Dean is required for a

student who has a GPA less than a 3.4. Students with higher GPA's are routinely allowed to take up to 20 credits without a memo from the advisor.

Summary: To graduate in 4 years = Average 16 credits/semester

C. General Education Requirements:

- The general education requirements at ISU are listed as 12 goals. The goals can be found in the front of any class schedule, in the University Bulletin, or online.
- The BA degree in the College of Arts and Sciences requires that all 12 goals be completed, including Goals 10A and 10B.
- A BS degree in the College of Arts and Sciences requires Goals 1,2,3,4,5; 2 of Goals 6,7,8; and 3 of Goals 9,10, 11, 12. Note that 10A + 10B is one goal, not two. That is, if a student has satisfied goal 10A he/she has satisfied goal 10. If a student has satisfied goal 10B he/she has satisfied goal 10. However, if a student has satisfied goal 10A and 10B he/she has still satisfied only one goal, and that goal is 10.
- The General Education Goals are similar to General Education Requirements at many Universities. They may be compared more easily when presented in the following way:

Goal #1	English Composition (ENGL 101 & 102)
Goal #2	Speech
Goal #3	Math ¹
Goal #4	Biological Sciences ¹
Goal #5	Physical Sciences ¹
Goals #6, 7, 8	Humanities
Goals #9, 10, 11, 12	Social Sciences

1. For all majors in the biological sciences, this goal is satisfied because of departmental requirements.

Summary: General Education Requirements

For a BA degree: All goals including 10A and 10B.

For a BS degree:

- Goals 1, 2, 3, 4, 5;
- 2 of Goals 6, 7, 8;
- 3 of Goals 9, 10, 11, 12 (note that 10A + 10 B is one goal, not two).

D. Departmental Requirements:

The Departmental requirements are listed in the University Bulletin, and there are copies of the requirements for each of our majors in the main office. The following information may be useful to you:

Math¹: The math requirement for most of the majors in this department is MATH 147 (Precalculus) and MATH 160 (Essentials of Calculus). Biochemistry requires Math 147, 170, and 175. Because students cannot take Math 170 for credit after taking Math 160 and because Math 170 is a prerequisite for Math 175, it is important for students to take Math 170 if they ever plan on taking additional math courses. The following information about math courses may be helpful:

- Math 143 (College algebra) + Math 144 (trigonometry) = Math 147 (Precalculus). Students who have completed Math 143 and Math 144 have completed the equivalent of math 147.
- If a student has taken Math 143 and Math 160, but not Math 144, the student must take Math 144. For students who qualify to take Math 160, or a higher math course, as their beginning math course, they can take only Math 160 or a higher math course.
- Calculus courses more advanced than Math 160 will substitute for Math 160. Statistics courses such as Math 253 do not substitute for either Math 147 or Math 160 (*the department has accepted Math 253 for some students who have taken Math 143 and 160, but not Math 144*).
- Students entering ISU as freshmen, or transfer students who have not completed a math course, are placed in an appropriate math course based on their ACT exam scores or on the results of a math placement exam.

Most Freshmen who are registering for the first time should have ACT scores.

<u>ACT Score</u>	<u>MATH CLASS</u>
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(more complete information at the end of this document)

23	MATH 143
27	MATH 160
29	MATH 170

- Some students may have to take non-credit math courses (MATH 50 and/or MATH 51) before taking MATH 147.
- Student may bypass MATH 147 if their ACT or math placement exam scores are high enough, they may take MATH 160 without MATH 147. However, if students take MATH 143, they must also take MATH 144.
- Specific information about the math placement exams or the minimum ACT exam scores is available by calling the Math Department. Most students will know their status as a product of applying for entry into ISU.

¹ Math 147 (old Math 117)	Math 160 (old Math 120)
Math 143 (old Math 111)	Math 170 (old Math 121)
Math 144 (old Math 112)	Math 175 (old Math 122)

- Students obtaining a B.S. in Biology, Botany, Ecology, or Zoology are required to take BIOS 315, Introduction to Biometry, or a comparable statistics class.

English: Students must achieve a minimum score on the ACT exam or achieve a minimum score on the English placement exam to take English 101. Some students with weak backgrounds in English are required to take a non-credit English course (ENGL 90).

<u>ACT Score</u>	<u>ENGLISH COURSE</u>
<i>(more complete information at the end of this document)</i>	
18-24	ENGL 101

More specific information about the English placement process or the minimum ACT or SAT exam scores can be obtained by checking page 26 in the current University Undergraduate Catalog.

Chemistry: Students should take Chemistry 111 & 112 during their freshman year or, at the latest, during their sophomore year.

- For Majors in Biology, Botany, Ecology, and Zoology, chemistry can be delayed until the second year, but not beyond that without creating major scheduling problems.
- Students in Biochemistry and Microbiology should enroll in Chemistry 111 and 112 during their freshman year.
- For students with weak math backgrounds, chemistry may be too much of a challenge for them during their first year. MATH 143, or MATH 147, is a pre-requisite for Chemistry 111.
- Generally, students planning to apply to professional schools should plan to take Organic Chemistry no later than their junior year. It is important to review the specific prerequisites for the type of professional school in question.
- Although not all of the B.S. degree programs in Biological Sciences require two semesters of organic chemistry, many graduate programs require students to have two semesters of organic chemistry or one semester of organic chemistry and one semester of biochemistry.

Physics: Generally, students who are planning to apply to professional schools need to take physics no later than their junior year. It is important to review the specific prerequisites for the type of professional school in question.

- Although not all of the B.S. degree programs in Biological Sciences require two semesters of physics, many graduate programs require students to have two semesters of physics.

Selected Biological Sciences Requirements:

Upper division Botany and Zoology: Biology majors must have 8 credits of upper division botany and zoology (a minimum of 3 credits in each category). A list of upper division botany and zoology courses is included in the list of requirements for the major available in the Biological Sciences and attached to the degree requirements for the Biology Degree.

Foreign Language: Two years of high school foreign language, in the same language, with C-grades or better substitute for the department's one-year requirement (high school transcripts must be delivered directly to the Department of Biological Sciences Office). Satisfying the departmental language requirement using this procedure DOES NOT satisfy Goal 10B.

Course sequences: Some of the major course sequences are listed here. Students need to be aware of course sequences to plan their schedules. There is a complete list of our course sequences in the Biological Sciences Office. The ISU Undergraduate Catalog identifies the frequency at which each course is taught. Some course sequences that affect student schedules are listed below:

	Fall	Spring
Anatomy and Physiology:	BIOS 301	BIOS 302
Human Physiology I and II:	BIOS 449	BIOS 456
Chemistry:	CHEM 111	CHEM 112
Physics:	PHYS 211 & 213	PHYS 212 & 214

Course rotations: Many of our upper division courses are offered only once a year or in alternate years. See the Course Rotation Schedule on the Department web site (under Undergraduate Programs) for details.

C. **Transfer students:**

- The ISU transcript for transfer students will identify many courses that are equivalent to ISU courses. If the ISU transcript for transfer students does not identify courses as being equivalent to courses at ISU, it may be easier to ask the Chair or Assistant Chair if courses on the student's transfer transcript are equivalent to courses in this department.
- If you tell a transfer student that a course they have taken is equivalent to one of our courses, you must write an explanation and place it in the student's departmental file in the Biological Sciences office. Without that explanation, the student is likely to receive notification that they will not graduate because of a deficiency.
- Students transferring to ISU with 58 or more credits, can meet the ISU General Education requirements by an alternative method. For example, students can satisfy the requirement for Goal 6,7, and 8 by taking 6 credits in the humanities instead of satisfying 2 of goals 6,7,and 8. Also, students can satisfy Goals 9, 10, 11, and 12 by taking 9 credits in the social sciences instead of satisfying 3 of goals 9, 10, 11, and 12.
- General Zoology (BIOL 202 and BIOL 202L) and General Botany (BIOL 203 and BIOL 203L) are considered to be a year of General Biology. If students have taken one semester of

General Biology (with a lab) at another school, they should take BIOL 102 to complete their year of biology.

- For students who have taken one semester of biology without a lab at another school, encourage them to take BIOL 101 and 102, OR BIOL 202, 202L, 203, and 203L. If the course appears to be a substantial biology course have them take BIOL 202L and BIOL 203 and 203L.
- Note that a foreign language is a departmental requirement for the BS in Zoology, Botany, and Microbiology.
- Transfer students who have graduated with an Associate of Science degree from CSI, NIC, or TVCC satisfy the general education requirements at ISU if they satisfy the core at those schools.
- Transfer students who have graduated with an Associate of Science degree from BYU Idaho (Ricks College) satisfy the general education requirements at ISU if they satisfy the core at BYU Idaho with the exception of speech (Goal 2; COMM 101). Some of the BYU Idaho students will transfer to ISU after having taken a semester of Freshman English and a sophomore English course at BYU Idaho (ENGL 211). These courses satisfy ISU's general education requirement.
- Transfer student with Associate Degrees from community colleges not listed above meet general education requirements as students who transfer to ISU with more than 58 credits.

Math Placement Guidelines

To register for a math course listed in the column at the left, a student must meet at least one of the criteria listed to the right of the desired course:

TO REGISTER FOR MATH	Requirement:						
	Successful completion of course #	ACT Math score	SAT Math score	COMPASS PreAlgebra Score	COMPASS Algebra Score	COMPASS College Algebra Score	COMPASS Trig Score
170*	144 or 147	29	650			71	55
144, 157, 160*, 230	143	27	620		84	63	
130*, 143, 147, 253*	108	23	540		61	49	
123*, 127*	025	19	460		45	37	
108	025	17	420		40	33	
025	015	12	250	53			
015	No Prerequisites						

* = Satisfies Goal 3

11/1/00

English Placement Guidelines

TEST SCORE	ENGLISH PLACEMENT
ACT English below 18 SAT Verbal below 450 COMPASS Writing score of 67 or below.	Engl 090
ACT English 18 - 24 SAT Verbal 450 - 560 COMPASS Writing score between 68 and 94.	Engl 101
ACT English 25- 30 SAT Verbal 570 - 690 COMPASS Writing score between 95 and 99. Students who use only the COMPASS Writing Test for placement into composition courses must take English 102!	given 3 credits for English 101 and place into Engl 102
ACT 31 or higher SAT 700 or higher COMPASS- no equivalent	given 3 credits each for Engl 101 and 102
Composition & Literature Advanced Placement (AP) Score 3 Advanced Placement (AP) Score 4 Advanced Placement (AP) Score 5	-given credit for Eng101 -given credit for Engl 101 and 110 -given credit for Engl 101, 110, and 102
Composition & Language Advanced Placement (AP) Score 3 or 4 Advanced Placement (AP) Score 5	-given credit for Eng101 -given credit for Engl 101, and 102