ADVISING MAJORS IN LIFE, EARTH, & ENVIRONMENTAL SCIENCES – INFORMATION FOR TRANSFER STUDENTS

Degrees offered:

Biology, B.S. & B.A.
Environmental Science, B.S.
  Environmental Science, Option I
  Geology, Option II
Wildlife Biology, B.S. & B.A.
Science 7-12 Certification, B. S.
Life Science Biology 7-12 Certification, B. S.

1. General Biology (Advisors: Arun Ghosh, Cindy Meador, David Sissom; Dr. Richard Kazmaier wants to see students with an interest in vertebrate biology).

The degree requires 1 year of Chemistry, 1 year of Physics or Geology, and math through Trigonometry, Pre-Calculus, ***or*** Elementary Stats (MATH 1342). If the student is more interested in medical topics or "human biology", they should be channeled towards Physics; if they are interested in animals, plants, or ecology (natural history), then Geology is the better option.

There is no "Biology Core" – students take whatever biology courses they want to fulfill the Major Requirements/Advanced Electives. BIOL 1406 & 1407 (General Biology I & II), or 1411 & 1413 (Botany and Zoology) are required to satisfy **Core 30**. For **Biology Electives**, six courses above the 1000 level are required (five must have lab).

39 hours of **Advanced Electives** will be required to complete the B.S. degree – i.e., 3000 and 4000 level courses with prefixes in math or sciences. For those at community colleges, these courses will be taken at WTAMU. There are a couple of cases where a course offered here at the 3000 level is available at a community college (e.g., genetics) – however, at the CC it will be at the 2000 level and will not satisfy the Advanced Elective requirement (it can be used to satisfy the Biology Elective requirement, however).

Those with serious intentions for graduate school should consider taking at least one semester of Organic Chemistry and Calculus (or Statistics). Most likely, the graduate school of choice will require them to have these courses (and some will require two semesters of Organic Chem). These are available at community colleges.

Core 90

3 hrs: ENGL 1302 or ENGL 2311
3 hrs: BIOL 1406L[1] and 1407L[1] OR 1411L[1] and 1413L[1]; and Fourth hour from MATH 2412[1] or Additional lab hour from Life & Physical Sciences.

Students can get involved with Beta Beta Beta. Although this is an honor society for students with more than 45 hours of coursework, there is an associate membership available

which allows students to participate even as freshman or if they don't have the grades for honor membership. The advisors for BBB are Cindy Meador and Rex Lee.

2. Pre-Health Care majors (Pre-med, Pre-dental, Pre-Physical Therapy, Pre-Occupational Therapy, Pre-Optometry). (Advisors for Pre-med are Carolyn Bouma, Donna Byers, and Cindy Meador; for Pre-dental, Donna Byers; for Pre-Physical Therapy/Occupational Therapy, Steve Karaganis; for Pre-Pharmacy, Rex Lee; for Pre-Optometry, Donna Byers).

Pre-Medicine, Pre-Dentistry, Pre-Pharmacy, Pre-Optometry, and Pre-Chiropractic schools require two years of Chemistry (General & Organic). With one exception (Baylor College of Medicine) they also require one year of Physics and either Calculus or Statistics. Even when advising freshmen, the advisor should keep in mind that most of these pre-professional students will be taking entrance exams (MCAT, DAT, OAT, PCAT) in the second semester of their junior year – they should have completed Organic Chemistry, Physics, and Calculus by that time. Therefore, **the freshman student in these disciplines should take the BIOL 1406/1407 and CHEM 1411/1412 sequences simultaneously in order to get on the right track**. If they do not have credit for College Algebra, they will have to start their Chemistry sequence after they have completed it – ideally, these students will take CHEM 1411 in the spring of their freshman year and 1412 in the summer. In any case, it is important that they start the CHEM 2523/2525 sequence in their sophomore year. [But if they can't, it won't be the end of the world – they'll just be a year behind the usual schedule].

[**NOTE**: Dr. Bouma has indicated that beginning with the 2015 MCAT, there is now a Social Science component on the exam. Therefore, it is preferred that students take PSYC 2301 to satisfy Core 80.]

The pre-professional students should be sent to their respective major advisors early to make sure they get the courses they need to apply for professional programs – professional schools often have different requirements. Detailed brochures on the pre-professional programs are available from the advisors in most of the particular areas. Students should also get involved in the **Pre-Healthcare Club** early in their academic career; information is available from Dr. Bouma.

There is also the JAMP program to think about for strong students that are "economically disadvantaged". This is a special program devised by the State Legislature. It is competitive and WTAMU has been fortunate to have several of our students selected. For more information see: http://www.texasjamp.org/students/homepage.htm

The professional programs are highly selective and it is imperative for the student to maintain an outstanding GPA and succeed on the entrance exams. This enhances their chances of getting the interview.

It is better for students to take BIOL 1406 and 1407 to complete their freshman biology sequence, but BIOL 1411 and 1413 would be satisfactory. Pre-medical students who have transferred BIOL 1408 and 1409 have been granted substitutions at WT, which is acceptable to the Medical Schools. However, the same is not true for most Pre-Dental and Pre-Pharmacy schools – *these require the majors sequence*.

Pre-Physical Therapy and Pre-Occupational Therapy students should consult with Dr. Karaganis during their first semester. There are no curriculum guides for these options – individual schools are too variable in their requirements to allow for that. Dr. Karaganis will urge the student to start looking at individual PT/OT schools to understand their individual entrance requirements.

Ditto for Pre-Pharmacy – these students should be consulting with Dr. Lee regularly.

Core 90
3 hrs: ENGL 1302 or ENGL 2311
3 hrs: BIOL 1406L[1] and 1407L[1] OR 1411L[1] and 1413L[1]; and Fourth hour from MATH 2412[1] or Additional lab hour from Life & Physical Sciences.

3. Environmental Science (Advisors: Jim Rogers, Naruki Hiranuma, Erik Crosman)

The degree is complex and multi-disciplinary – lots of biology, chemistry, and geology. The courses required for the degree are clearly identified in the academic catalog. Since there are multiple Geology and Biology courses in the curriculum, it is important to get the students into freshman Geology (1403 and 1404), BIOL 1406, and ENVR 1407 as soon as possible (freshman and sophomore years, respectively). It is wise for the student to touch base with Dr. Rogers or Dr. Hiranuma during their freshman year.

Freshman Environmental Science majors should take BIOL 1406 (fall) and ENVR 1407 (spring) to satisfy Core 30. Any student taking BIOL 1407 previously can be granted a course substitution for ENVR 1407).

Core 90
3 hrs: ENGL 1302 or ENGL 2311
3 hrs: BIOL 1406L[1] and ENVR 1407L[1]; and Fourth hour from MATH 2412[1] or Additional lab hour from Life & Physical Sciences.

There are many opportunities for research and field experiences, and the student should become aware of these and participate.

The Environmental Science Society is the student organization for environmental science majors. Students can hear professional presentations and go on trips (e.g., caving in New Mexico, rafting in Colorado); participation in fund-raisers makes this possible.

A note about Geology. The B.S. in Geology was discontinued in 2012 and the teach out period ended August 2018. ***There is no possibility of any student majoring in Geology at WTAMU, and there are no longer any active Geology majors***. A new or existing student with an interest in Geology can get a **B.S. in Environmental Science with a Geology Option** – this is essentially our old ENVR Science/Geology double major (however, it is technically not a geology degree).

Geology Option (Advisor: Mark Holland)

Be sure to get those selecting the Geology Option into GEOL 1403 for the Fall Semester and 1404 in the Spring Semester of their first year! These serve as prerequisites for many subsequent courses they will take. Other degree requirements are straightforward and indicated in the catalog. BIOL 1411 (Botany) and 1413 (Zoology) are preferred for those in interested in Paleontology, but 1406 and 1407 will work for the others. The biology courses can wait until the second year. Requirements from other departments include one semester of Physics (1401), as well as Calculus or Statistics (in the form of MATH 3360 or BIOL 4416).

The student organization for Geology majors is the Geological Society. It is also an active group. There are speakers and possible field trips to sites of geological interest in the area.

4. Wildlife Biology (Advisors: Ray Matlack [mammals and birds], Rich Kazmaier [reptiles, amphibians, fish]; Brad Johnson [ecology, amphibians, fish])

The degree requirements are explicitly listed in the academic catalog. One difference between this degree and Biology is that Geology 1403 only is required (instead of two semesters of Geology or Physics). This degree also requires BIOL 1411 (Botany) and BIOL 1413 (Zoology) as the introductory biology sequence. Be careful not to put students into BIOL 1406 or 1407; however, the Wildlife advisors will allow the student credit for BIOL 1411 if they have taken **both** BIOL 1406 & 1407 (by transfer or change of major). **Botany (BIOL 1411) is important (along with BIOL 3532 later) to enable the student to acquire the 9 hours of coursework in botany needed to become certified as a Wildlife Biologist. Not many of our students get the certification, but if they want it they will need both courses.**

At least by the spring semester of the freshman year, the student should be in BIOL 2374 (Intro to Wildlife Conservation); this is a prerequisite for two important classes. Dr. Matlack is agreeable to letting a student take BIOL 2374 concurrently with either botany or zoology – this will require a schedule change form, however.

Core 90
3 hrs: ENGL 1302 or ENGL 2311
3 hrs: BIOL 1411L[1] and 1413L[1]; and Fourth hour from MATH 2412[1] or Additional lab hour from Life & Physical Sciences.

It is important that the student touch base with their potential advisors (based on their interests) as soon as possible, probably even during the first semester.

The Wildlife Club is an active organization. The club meets twice monthly (Thursday evenings) and is largely speaker-based; some workshops on getting jobs and summer employment; occasional service opportunities. There is a lot of participation by Texas Parks & Wildlife and U.S. Fish & Wildlife Service biologists.

If you are advising a wildlife biology student, make them aware of the possibility of participating in field research as an undergraduate. All four advisors are very active in research at a variety of locations in the Texas Panhandle and other parts of Texas.

Undergraduates have opportunities to assist them, their graduate students, and (in later years) develop their own research projects.

5. Science 7-12 Certification (Education) (Advisor: Cindy Meador).

Get the student in BIOL 1411 and 1413 in their freshman year and connect them with their advisor. These are prerequisites for upper level courses. They will use BIOL 3440 (offered summers only) in lieu of 2401 and 2402; course substitutions are possible if they happen to come to WT as a transfer student with 2401 and 2402, but **both** are required in order to grant the substitution.

6. Life Science Biology 7-12 Certification (Education) (Advisor: Arun Ghosh).

Get the student in BIOL 1411 and 1413 in their freshman year and connect them with their advisor. These are prerequisites for upper level courses. They will use BIOL 3440 (offered only in summers) in lieu of 2401 and 2402; course substitutions are possible if they happen to come to WT as a transfer student with 2401 and 2402, but **both** are required in order to grant the substitution.

Jobs available

1. Biology

Opportunities are fairly limited for someone with a B.S., unless they are willing to move or teach in the public schools (Teachers Certification/PACE). Getting a Masters Degree opens more doors, including teaching in community colleges. Examples of jobs include lab technicians (medical facilities, environmental agencies, etc.), pharmaceutical sales (these companies like the broad science training that biology majors receive), working in zoo and aquarium facilities or at nature reserves (as interpretive guides, etc., but not as wildlife biologists).

A. Pre-Medical, Pre-Dental, Pre-Pharmacy, etc.

The goal of these students is to get into the appropriate professional school. Almost all enter professional programs after completing the Bachelor's Degree (usually with a Biology major). Careers, if successful, are self-explanatory. However, the option of going M.D./Ph.D. is available for those wanting to go into medical research.

2. Environmental Science

The employment rate for our graduates in Environmental Science approaches 100%, and many of our graduates get multiple job offers. Employers include environmental agencies, Pantex, oil & gas companies, state agencies, environmental consulting firms. Some go on to Graduate School, and our Masters students are equally successful (and get better jobs).

Someone with a B.S. in Environmental Science (Geology option) can often work in the petroleum industry. There is an open question at this time as to whether these employers will accept the B.S. in Environmental Science/Geology Option as a substitute for a Geology degree. Teaching earth science in public schools is another option (Education/PACE). Graduate school in physical and historical geology (paleontology), as well as specialized subdisciplines are good options, and qualify students for college level teaching jobs. The graduate degrees will also increase the employability of the student in industry.

4. Wildlife Biology

Our wildlife biology degree enables graduates to pursue employment in the field of wildlife management/wildlife biology. Employers include the state and federal governments (nature reserves, parks), conservation agencies. Some students will be interested in becoming game wardens, interpretive guides, or park rangers; the game warden school in Austin prefers that students have a Wildlife Biology degree before entry. Some students will go on to graduate school, with the intention of teaching at the community college or university level or becoming research scientists. Their chances of employment in the field as wildlife management specialists or wildlife biologists are enhanced with the graduate degree.