# Biology 510 – Contemporary Issues in Biology I

## Course Syllabus

**Instructor:** Dr. David Allard  
**Office:** 219A SCIT  
**Schedule:**

<table>
<thead>
<tr>
<th>Class times</th>
<th>Office Hours</th>
</tr>
</thead>
</table>
| BIOL 308 – 5:00-8:40 M  
BIOL 2402 – 9:30-12:00 TR  
BIOL 450 – 1:00-4:40 F  
BIOL 510 – TBA | 1:00 - 5:00 M  
12:00 – 3:00 TR  
I am usually in my office on most days unless I am traveling or in a meeting. It is a good idea to call before you come in case I am out. |

Check [http://www.tamut.edu/~allard/officehours.htm](http://www.tamut.edu/~allard/officehours.htm) for updates.

**Phone:** (903) 334-6672  
**Personal Webpage:** [http://www.tamut.edu/~allard/index.html](http://www.tamut.edu/~allard/index.html)  
**Email:** David.Allard@tamut.edu  

## Course Description:

This course will focus on important contemporary topics in biological science. These topics will include such issues as DNA and the Human Genome Project, human development and stem cells, genetic disorders and gene therapy.

## Required Textbooks/Resources:

None required

## Student Learning Outcomes:

After completion of this course the student will be able to:

- Describe how genes and the environment influence the diversity of humans.
- Discuss the role of DNA sequences for genetic differences, and association with disease, survival, and evolution.
- Explore the links between genetic variation, environmental factors, and disease prevention.
- Show how genetic variation testing exemplifies difficult moral
and social questions for our society.
- Discuss the diversity of cancer.
- Explain the process of cancer genesis via cell cycle regulation; disruptions..
- Test several hypotheses about cancer development.
- Apply a model system to test media claims about cancer.
- Identify stem cells.
- Explain somatic cell nuclear transfer.
- Discuss the differences between adult stem cells.
- Explain how stem cells can be used to fight human disease.
- Elaborate on the role of stem cells in regeneration.
- Discuss the human genome project.
- Define chemical genetics.
- Define bioinformantics.
- Discuss the use of chemical genomics in medicine.
- Explain what SNPs are and how they are related to genome privacy.
- Use a new model for examining bioethical issues.
- Apply this model to two cases involving the use of enhancements in sports.
- Determine and justify a position that balances individual rights against the best interests of a school community.
- Apply bioethics concepts to scenarios involving the allocation of donated organs.
- Recognize the harms and benefits of genetic testing by studying cases that have implications for confidentiality, privacy, and self-determination.
- Understand the widespread benefits of medical research on humans as well as the ethical challenges and risks of participating in such research.
- Examine human responsibilities to animals and analyze whether respect for persons should be extended to other species.

<table>
<thead>
<tr>
<th>Course Outline:</th>
<th>I. HUMAN GENETIC VARIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a. Histograms and human traits</td>
</tr>
<tr>
<td></td>
<td>b. Variations in betaglobin genes</td>
</tr>
<tr>
<td></td>
<td>c. Medical benefits of understanding variation at a molecular level</td>
</tr>
<tr>
<td></td>
<td>d. Relationship between genetic and environmental factors in heart disease</td>
</tr>
<tr>
<td></td>
<td>e. Personal and social implications of genetic testing</td>
</tr>
<tr>
<td>II. SCANNING LIFE’S MATRIX: GENES, PROTEINS, AND SMALL MOLECULES</td>
<td>a. Reading genes and genomes</td>
</tr>
</tbody>
</table>
| Methods of Evaluation: | b. Probing genes and genomes  
| | c. Human genetics: a new guide for medicine  
| | d. Chemical genomics  
III. SNPs: A CASE STUDY ON GENOME PRIVACY  
| a. Define the term SNP and list three uses of snp technology.  
| | b. Design an experiment to identify snps.  
| | c. Describe a potential privacy issue associated with snp technology.  
| | d. Explain the current status of genome privacy laws.  
| | e. Apply scientific reasoning skills to an ethical issue in science.  
| | f. Write a letter to your United States Representative for/against passage of the Genetic Information Nondiscrimination Act.  
IV. CELL BIOLOGY AND CANCER  
| a. People’s experiences with cancer  
| | b. How cancer develops  
| | c. Testing hypotheses about cancer  
| | d. Case study: UV exposure to cancer  
| | e. Legal and ethical implications  
V. POTENT BIOLOGY: STEM CELLS, CLONING, AND REGENERATION  
| a. Understanding embryonic stem cells  
| | b. Adult stem cells and regeneration  
| | c. Coaxing embryonic stem cells  
| | d. Stem cells and the end of aging  
VI. EXPLORING BIOETHICS  
| a. A problem-solving approach to ethical decisions  
| | b. Core ethical considerations for “respect for persons” and “fairness”  
| | c. Harms and benefits  
| | d. Human responsibilities to the natural world  

1. Exams  
Two essay exams (a Midterm and a Final) will be administered to evaluate the concepts discussed in class. The exams will be comprehensive evaluations of all material covered in the course.

2. Reflections on Class Topics  
Students will reflect upon daily topics of discussion by completing a written essay following each class. Reflections will be posted on the class Blackboard site. Additional points may include opinions, questions, current research findings, and changes in thought as a result of classroom topics and activities.
reflections should be written in first person point of view.

3. Research paper
Each student will prepare a 5000 word research paper on a topic related to the course. The student must turn the topic into the professor for prior approval. The paper will be written in CBE style.

<table>
<thead>
<tr>
<th>Grading Scale:</th>
<th>A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, F = 0-59%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Participation:</td>
<td>Participation Policy: Participation in the course will include attendance at all scheduled meetings and collaboration with other students in a group at assigned stations in lab. <strong>Course Etiquette:</strong> Informal class participation is welcome. Please do not make comments that are off the subject or that impede the progress of the class. Cell phones are to be turned off.</td>
</tr>
<tr>
<td>Disability Accommodations:</td>
<td>Students with disabilities may request reasonable accommodations through the A&amp;M-Texarkana Disability Services Office by calling 903-223-3062.</td>
</tr>
<tr>
<td>Academic Integrity:</td>
<td>Academic honesty is expected of students enrolled in this course. Cheating on examinations, unauthorized collaboration, falsification of research data, plagiarism, and undocumented use of materials from any source constitute academic dishonesty and may be grounds for a grade of ‘F’ in the course and/or disciplinary actions. For additional information, see the university catalog.</td>
</tr>
<tr>
<td>Drop Policy:</td>
<td>University Drop Policy: To drop this course after the 12th class day, a student must complete the Drop/Withdrawal Request Form, located on the University website <a href="http://tamut.edu/Registrar/droppingwithdrawing-from-classes.html">http://tamut.edu/Registrar/droppingwithdrawing-from-classes.html</a>) or obtained in the Registrar’s Office. The student must submit the signed and completed form to the instructor of each course indicated on the form to be dropped for his/her signature. The signature is not an “approval” to drop, but rather confirmation that the student has discussed the drop/withdrawal with the faculty member. The form must be submitted to the Registrar’s office for processing in person, email <a href="mailto:Registrar@tamut.edu">Registrar@tamut.edu</a>, mail (P. O. Box 5518, Texarkana, TX 75505) or fax (903-223-3140). Drop/withdraw forms missing any of the required information will not be accepted by the Registrar’s Office for processing. It is the student’s responsibility to ensure that the form is completed properly before submission. If a student stops participating in class (attending and submitting assignments) but does not complete and submit the drop/withdrawal form, a final grade based on work completed as outlined in the syllabus will be</td>
</tr>
</tbody>
</table>
Upon application to Texas A&M University-Texarkana an individual will be assigned an A&M-Texarkana email account. This email account will be used to deliver official university correspondence. Each individual is responsible for information sent and received via the university email account and is expected to check the official A&M-Texarkana email account on a frequent and consistent basis. Faculty and students are required to utilize the university email account when communicating about coursework.

### Student Technical Assistance:

- Solutions to common problems and FAQ's for your web-enhanced and online courses are found at this link: [http://www.tamut.edu/webcourses/index.php?pageid=37](http://www.tamut.edu/webcourses/index.php?pageid=37)
- If you cannot find your resolution there, you can send in a support request detailing your specific problem here: [http://www.tamut.edu/webcourses/gethelp2.php](http://www.tamut.edu/webcourses/gethelp2.php)
- Blackboard Helpdesk contacts:
  
  Office hours are: Monday - Friday, 8:00a to 5:00p
  
  Kevin Williams (main contact) 903-223-1356  
  kevin.williams@tamut.edu
  
  Frank Miller (alternate) 903-223-3156  
  frank.miller@tamut.edu
  
  Nikki Thomson (alternate) 903-223-3083  
  nikki.thomson@tamut.edu

The instructor reserves the right to make changes to this syllabus as necessary.