COURSE DESCRIPTION: Physiology is a course that introduces students to physiological processes that are a product of the interactions of complex tissues, organs and organ systems, each of which are regulated by complex patterns of genetic regulation in individual cells. This course focuses on the physical and chemical laws that apply to all physiological processes, the importance of homeostasis, the role of phenotype and therefore genotype in physiological processes, environmental influences on physiological processes, and the evolutionary changes that produce genotypes.

PREREQUISITE: BIOL 1407 is required.

COREQUISITES: Students enrolled in BIOL 3430 lecture MUST ALSO be registered in the laboratory portion of the course. IT IS ALSO STRONGLY SUGGESTED THAT STUDENTS NOT ENROLL IN THIS COURSE IF THEY HAVE NOT TAKEN BIOL/BIMS 2200.

REQUIRED TEXTS:


Other materials: Each student is required to have a stick/flash/thumb drive and one notebook for the lab. All students will need lab coats and must comply with all dress code regulations which includes wearing: long pants, closed toed and closed heel shoes, and putting up/back long hair.

REQUIRED E-MAIL: All students must have a Texas A&M University-Corpus Christi e-mail account. Make sure that you can access and use it because, for students in my classes, it is the only e-mail address to which I will reply. Please go to http://www.tamucc.edu/ise.html to obtain a new islander account.
Physiology

TENTATIVE LECTURE SCHEDULE:

<table>
<thead>
<tr>
<th>Week</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (June 1, 2, 3, 4)</td>
<td>Respiration and Circulation: Chapters 21, 22, 23, 24, 25</td>
</tr>
<tr>
<td>2 (June 8, 9, 10, 11)</td>
<td>Water, Salts and Excretion: Chapters 26, 27, 28, 29; Test 1: June 11</td>
</tr>
<tr>
<td>3 (June 15, 16, 17, 18)</td>
<td>Food Energy &amp; Temperature: Chapters 5, 6, 7, 9, 10; Test 2: June 18</td>
</tr>
<tr>
<td>4 (June 22, 23, 24, 25)</td>
<td>Movement: Chapters 19, 11, 12; Test 3: June 25</td>
</tr>
<tr>
<td>5 (June 29, 30, July 1)</td>
<td>Sensory and Endocrine Systems: Chapters 13, 15</td>
</tr>
<tr>
<td>Final</td>
<td>July 2, 2015</td>
</tr>
</tbody>
</table>

GRADING: Your final letter grade will be based on the points you earn in lecture and laboratory. The final grading scale will also be determined at the end of the semester, but the cut-off for each grade will be no higher than the following:

\[ A \geq 90\% > B \geq 80\% > C \geq 70\% > D \geq 60\% > F \]

Evaluation: Final course grades will be determined by the following:

- Lecture: 70%
- Research project paper and presentation: 30%
- Total: 100%

LECTURE EXAMINATIONS: I will give three examinations and one final during the course. I will be taking questions for these tests primarily from material covered in the lectures. Examinations will be multiple-choice, short answer questions and/or drawings. The three lecture examinations are sequential (i.e., each examination covers material from one specific section of the course). The final examination is comprehensive (i.e., covers material from the entire course).

- If your average grade from the three lecture exams is a B or higher, you can skip the final.
- You must take the final if your average grade from the three lecture exams is a C or lower.
  *If you do not take the final (i.e. as stated in the previous sentence), I will count the final as a zero and it will be part of your grade for the course ie in this case it will not be redemptive.*

- The final is redemptive. In other words, if you earn a higher score on the final than on one of your lecture exams, it will be doubled to replace your lowest examination grade: The average of the two highest non-final examinations plus double (2x) the final examination. Taking the final will not hurt you, it can only benefit you. Exception see “*” above.
Because of this flexibility, however, no make-up examinations are allowed, except in extreme emergency situations.

Sample calculations: $T = \text{Tests in lecture;} \ F = \text{Final}$

- $(T1 + T2 + T3)/3 = \% \text{ in lecture. If that } \% \text{ is 79 or lower, you must take the final.}$
- Taking the final: $(T + T + F + F)/4 = \% \text{ in lecture after final. This gives the final a lot of power as it counts twice and replaces lowest lecture test grade.}$
- Not taking the final with a 79% or lower in lecture = 0 for final: $(T1 + T2 + T3 + 0)/4 = \% \text{ in lecture after final. In this case, your } \% \text{ in lecture will decrease as you did not take the final as required by the rules.}$

BONUS POINTS: No individual extra credit assignments will be available in this class. I may provide opportunities for the entire class to earn additional bonus points (e.g., attendance, video assignments, written reports, library or web exercises, un-announced quizzes, etc.). Such opportunities may be offered or announced only once, so be in class, be on time and stay for the entire period. Extra points are also built into all examinations (as extra questions). Bonus points (from quizzes, exercises, etc.) cannot be made up—period.

Miscellaneous: Bring two #2 pencils to each lecture examination (including the final examination); I neither provide nor sell pencils. I will provide Scantron sheets for you. After an examination is returned, you have one (1) week to notify me of clerical, mathematical, and/or other errors. I will rectify any such errors, but I will not change a legitimate grade just because you “need” it. I am available for consultation and extra help, but it is the student’s responsibility to request help.

Spelling and Legibility: Spelling counts—in both lecture and in laboratory. To be considered for partial credit, your answer must phonetically sound like the word that you are trying to spell. Examples of answers that are incorrect:

- Grossly misspelled words (e.g., “crevurfn pleat” for “cribriform plate”).
- Ambiguous answers (e.g., “tibula”—could be “tibia,” could be “fibula”).
- Illegible answers (e.g., “ep-squiggle-squiggle-squiggle” for “epididymis”).

STUDENT LEARNING OUTCOMES: Students will learn and use the vocabulary of physiology; students will learn and use the data of physiology as demonstrated by their ability to remember homeostatic values for cellular ions, membrane potential, hormones, blood pressure, pulse rate, body temperature, hematocrit, oxygen and carbon dioxide partial pressures, osmolarity, pH, sodium and potassium concentrations, glucose concentration, white blood cell count, etc.; students will learn the functions of: physiological systems, food,
energy, temperature, muscle, internal transport, oxygen, carbon dioxide, excretion, water and salts; students will learn the integrative nature of physiology by studying the interaction of the various animal body’s systems to produce homeostasis; students will develop a hypothesis and an experimental design for testing their hypothesis; students will conduct research and collect data according to their experimental design; students will present their research in written form according to standards used by typical scientific, peer-reviewed journal articles; students will present their research in oral form using Power Point slides and standard scientific meeting protocol.

ATTENDANCE POLICIES: Attendance is the student’s responsibility and students are expected to attend every class and laboratory. The problem with missing labs is that under no circumstances will a student who missed a lab be allowed to turn in any assignments from that particular lab. If you know in advance that you will miss an exam or lab due to official University business, you must provide the Professor with official documentation of the absence at least fourteen days prior to missing. It is the student’s responsibility to obtain official documentation in a timely fashion. Once the documentation has been verified, the Professor (Dr. Gardner) will decide how to handle the absence. In the overwhelming majority of cases, assignments and exams will be turned in or completed prior to the planned, official absence. Exams given outside regularly scheduled times may vary in format and content at the discretion of the Professor. Absolutely nothing may be turned in late by anyone for any reason. Labs are three hours long and students are expected to be in lab for all three hours each lab period. There is always work that can be done while in lab. Students who are diligent during regularly scheduled labs will have an advantage over those who are not. Those who spend little time in lab may have their final paper and/or presentation grades adjusted downward. Missing laboratories will result in loss of points.

ABSENCES: You are responsible for the material covered and assignments made in every lecture and laboratory regardless of whether you attend it. “I came in late and didn’t hear about the assignment,” is never an acceptable excuse. It is always your responsibility to determine what happened in class or laboratory during your absence. You must obtain class or laboratory notes from other students (i.e., I do not “share” my notes).

Points missed because of an unexcused absence (including tardiness and leaving early) cannot be recovered. An excused absence is emergency allows us to make alternative arrangements if necessary. The documentation required for an absence to be excused must be…

- from an appropriate source (e.g., doctor, dentist, funeral director) who states the nature of the event that caused (or will cause) your absence. Also must state appropriate date(s).
- in writing, on official stationery, and signed. (I do not return excuses to you.) Telephone calls, Faxes, and e-mails are not acceptable.
- presented prior to the absence for a scheduled event (e.g., university-sponsored activity, recognized religious holiday, military service).
- presented no more than one week after the date of an unexpected absence.
- **Approved by Dr. Gardner. These rules apply to both lecture and laboratory. Your teaching Assistant cannot approve any such absences or make arrangements without Dr. Gardner’s approval. If these rules are not followed, you will not receive credit for assignments or tests.**

**UNACCEPTABLE EXCUSES:** Only unavoidable absences are excused, so you should schedule routine personal events (e.g., vacations, weddings, reunions, non-emergency medical or dental visits, parent-teacher conferences, household or auto repairs) to avoid conflicts with your classes. Oversleeping is never an acceptable excuse. Employment conflicts are not acceptable excuses for absences, tardiness, or leaving class early. (Once enrolled in a class, it is the student’s responsibility to arrange his or her work schedule so that no regularly scheduled class, laboratory, or examination time is missed). Texas waives jury duty for students, so jury duty is not an acceptable excuse. With a legitimate excuse, you may attend a different laboratory section (including a practical examination) during the same workweek, if—and only if—(1) there is room for you, and (2) you obtain permission from the instructor. If you arrange to take any test at an alternate time and do not show for that appointment, then you forfeit the opportunity to take the test except at its originally scheduled time. Special circumstances that may warrant giving an individual a make-up test will be referred to Student Affairs. A make-up test given after the original test will be all written (i.e., no multiple choice or matching), and it will be administered on the last “Flex Day”.

**EXPECTATIONS:** You are adult University students. I will treat you as such, and I will expect you to act as such. You will act with courtesy and common sense. I will not tolerate disruptive, disrespectful, or abusive behavior/language directed toward anyone in this class (i.e., student or instructor). Violations range from talking during class to outright insubordination, and will result in penalties that range from the student being asked to stop to the student being “escorted” from the class - permanently. **Cellular phones (including text messaging), pagers, and other “beepers” must be turned off in the classroom and laboratory.** (I will make exceptions for certain “emergency” personnel, but you must see me to obtain this). **I will also remove points if the rules are not respected.** Children are not allowed in the rooms during lecture or laboratory periods, or when the child’s guardian is working or studying “after hours.”
LEARNING: Learning is more than just reading, taking notes and memorizing. Reading and taking notes puts information in short-term memory where it is forgotten quickly unless you do something with it. Memorizing, though important, is but the first step in the learning process. As university students, you should be able to link, combine and synthesize the bits of data that you memorize into useful concepts.

Academic Integrity/Plagiarism*
University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

SCHOLASTIC DISHONESTY WILL NOT BE TOLERATED. University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. It will be prosecuted to the full extent of University regulations (see the Student Handbook and the Catalog 2010-11: Texas A&M University-Corpus Christi). The following procedures will be enforced:

- You must be prepared to present a photo ID at all examinations.
- Different test forms may be prepared for a single examination. To ensure that the appropriate key will be used to grade your answer sheet, always follow instructions on the test or answer sheet, or given orally by the instructor.
- If you leave an examination room—for any reason—you must hand in your answer sheet and you will not be allowed to resume the examination. Attend to personal matters (e.g., rest room visits) before the examination.
- Be on time! Anyone arriving after someone has completed an examination and left the room will not be allowed to take that examination and will receive a 0 for that exam.
- Cheating and plagiarism are unacceptable behaviors. Cheating in lecture or laboratory will result in an F in the course, if it is the student’s first offense.

Dropping a Class*
I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course.
drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. (June 19, 2015) is the last day to drop a class with an automatic grade of “W” this term.

**Grade Appeals***

As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage (http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

**Disabilities Accommodations***

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

**Statement of Academic Continuity***

In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

**Academic Advising:** The College of Science and Technology requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which
must be signed by the student, a faculty mentor, and the department chair. The College’s Academic Advising Center is located in the Center for Instruction (CI), Suite 350, and can be reached at 825-3928.

Classroom/professional behavior**
Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

Statement of Civility (can be in place of classroom/professional behavior)**
Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

LEARNING: Learning is more than just reading, taking notes and memorizing. Reading and taking notes puts information in short-term memory where it is forgotten quickly unless you do something with it. Memorizing, though important, is but the first step in the learning process. As university students, you should be able to link, combine and synthesize the bits of data that you memorize into useful concepts.

LABORATORY (30% of final grade)
Students will also be required to complete a 10- to 15-page (double spaced, no font larger than 12 pt., margins no greater than 1 inch top/bottom/left/right) group paper based on a group research project completed in lab. Groups will consist of no more than four (4) people. The research project will be explained by Dr. Gardner and the TAs and will be based on a simple well-defined hypothesis and should follow the scientific method. Students who have not had statistics will want to do background research on appropriate sample size and on appropriate statistical analyses for the data gathered. Valiela (2001) is to be read and used to complete this portion of the course successfully. It will be assumed that ALL students have used the Valiela book when considering experiments, and in preparation of the paper and presentation possible problems with the design should be presented. In addition to the paper itself, a 15 minute oral synopsis of the group research project will be presented in lab or lecture. All members of the group are required to
participate in the oral presentation. Students are required to use a PowerPoint slide show for the oral presentation. All student groups are required to obtain approval of research projects from Dr. Gardner and the lab TA. It is also strongly recommended that each group discuss their projects and papers with Dr. Gardner and/or the TA throughout the semester. All students are required to keep a lab notebook that includes information about all experiments. This will prevent having to ask questions about lab procedures later in the semester when groups are running their own experiments. It is each student’s responsibility to know how to hook up and run all equipment and experiments. It is not the TA’s responsibility to answer questions about procedures previously done in labs. Each member of each group is to be familiar with all procedures and methods.

You will receive detailed instructions on how to write your lab report and on the format of the oral presentation in lab and/or lecture. You will also receive a schedule that must be followed ie deadlines for outline of project, report, etc. Dr. Gardner and/or the TA will give a mock presentation in class to be used as a guideline as to what is expected. For the paper, detailed guidelines will be given and it is expected that the students familiarize themselves with the scientific literature as part of the research project.

Group work: When working on the group research project and presentation, the workload should be evenly distributed between each member of the group. It is vital that each group member do his/her equal share. It is expected that group members will work together. It is the responsibility of each student to get to know each member of their group and to obtain appropriate information about contacting group members outside of lab. Problems that arise must be worked out within the group if at all possible. If one or more of the group members are not performing to the others’ satisfaction, it is up to the group to document the nonparticipation.

To resolve problems within the group:
1) Try to compromise as a way to work out the problems amongst yourselves.
2) If that doesn’t work, bring the problem to the attention of the TA as soon as possible along with documentation of the issues, and a plan of action as to how the problem(s) should be resolved.
3) Schedule a group meeting with the TA to discuss the problem.
4) If the meeting does not solve the problem, with the TA’s permission, the group member may be expelled. If the member is not expelled by June 11, 2015, the group is stuck with the problem.
5) A member who is expelled must complete a project, paper and presentation on their own or receive a 0 for the project (both the paper and the presentation). Again, this is up to the group. The TA or Dr. Gardner cannot initiate this action.
6) Keep in mind that each group member will anonymously evaluate each member of his/her own group. Students receiving less than satisfactory scores from other members of the group may receive significantly lower grades on the paper and/or presentation.

**Objective:** The objective with the research project is to give the students experience with the scientific method. The scientific method is a step by step process for asking questions, developing explanations, and testing those explanations against the reality of the natural world. There are five (5) main interrelated operations (steps) in this method: observation, question, hypothesis, prediction and test.

Step 1 Observation: All scientific inquiry begins with observing a specific phenomenon in the natural world.
Step 2 Question: These observations lead to a question, such as "How did that happen?"
Step 3 Hypothesis: A hypothesis is formulated in answer to the question. A hypothesis is a possible explanation, a preliminary conclusion, or even an educated guess as to the solution to the problem. To be useful, a hypothesis must be testable by experimentation or further observations. The hypothesis must be tested in a way that allows it to be proven false. We can never prove that a hypothesis is true, but we can support the hypothesis if repeated experiments do not find it false.
Step 4 Prediction: Typically the prediction is phrased in an "if...then" form. If this happens then logically that will happen.
Step 5 Test: The test stage or experimentation process can include further observations or the testing of the hypothesis against a known situation or element (control). In order to ensure validity of the experiment replicating the experiment is necessary. The results of the experimentation should either support or refute (disprove) the hypothesis.

Once the experiment has been concluded, a conclusion is drawn about the validity of the hypothesis. If the hypothesis is refuted then the hypothesis is revised or a new one is formed. If the hypothesis is supported additional predictions can be made and tested.

**GENERAL DISCLAIMER:** We reserve the right to modify the information, schedules, assignments, deadlines, and policies in this syllabus if and when necessary. Whenever possible, we will announce such changes in a timely manner during regularly scheduled lecture or laboratory periods. We will not attempt to contact students who were absent when an announcement was made. Nevertheless, all students are responsible for abiding by all announced changes, and it is a student’s responsibility to obtain this information. In rare cases, some modifications may be implemented without prior warning.