Spring Semester 2018

Course Number: BIOL 1436.02
Class Time: T Th 11:00-12:20
Room: LDB 213

Course Number: BIOL 1436.06
Class Time: T Th 2:00-3:20
Room: LDB 207

Course Number: BIOL 1436.24
Class Time: MWF 9:00-9:50
Room: LDB 207

Course Number: BIOL 1436.40
Class Time: MWF 1:00-1:50
Room: LDB 213

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Office Number: LDB 302
Office Hours: Tues.1:00-2:00

Course Description/Rationale: The rationale for this course is to enhance your scientific literacy by making science both interesting and relevant. This will be accomplished by helping you understand how science works and how you can apply science in your daily life, especially when evaluating extraordinary/unusual claims in which almost everyone is interested – including UFOs, ESP, and mysterious creatures like Big Foot.

Accordingly, the overarching objectives of this course are to enhance your scientific literacy and critical thinking skills using an integrated, multidisciplinary approach that draws upon key concepts from the natural sciences, psychology, and critical thinking. The three broad goals of this integrated course are:

1) to enhance your understanding and appreciation of science as a proven and reliable method of comprehending the natural world, and to help you distinguish scientific from non-scientific and pseudoscientific ways of thinking about the world;
2) to provide you with a more well-rounded understanding of science by teaching you the basic principles, facts, laws, and theories from the natural sciences and, when relevant, from psychology;
3) to teach you specific rules of critical thinking so that you can use them, and your knowledge of science and the scientific method, to make more informed decisions. All three goals are inseparable and are interwoven throughout the course.

These three goals will be accomplished by using information from the natural sciences, the scientific method, and rules of critical thinking to examine a range of claims that are common in our society. These claims include, but are not limited to, extraordinary claims and pseudoscientific claims such as those pertaining to astrology, UFOs, legendary creatures, the lost continent of Atlantis, alternative medicines, paranormal phenomena, and others. Through an examination of these and other topics, as well as the evidence for key scientific theories, you will learn more about the nature of science and the scientific method, how to more reliably evaluate the veracity of claims, and how to avoid common errors in reasoning that lead to erroneous conclusions. This knowledge will help protect you from fraudulent and misleading claims and will enable you to make more informed decisions regarding issues of significance to our society. Finally, it is my hope that you will gain a greater appreciation of the beauty and wonder of the natural world as revealed by science.

Upon successful completion of the course, you will be able to:

1. Understand and apply scientific terminology pertaining to the nature and conduct of science, such as hypothesis, law, theory, control group, placebo group, confirmation bias, and double-blind study;
2. Apply methods of reasoning used by scientists: i.e., the scientific method based on the requirements of falsifiability/testability, logical consistency, comprehensiveness of evidence, intellectual honesty (objectivity), replication of results, and sufficiency of evidence;
3. Analyze and evaluate common logical fallacies and perceptual biases that interfere with the ability to draw reasonable and/or correct conclusions, as well as the difference between facts, informed opinions, and uninformed opinions;
4. Learn key concepts and theories from a variety of scientific disciplines, especially physics, biology, and geology;
5. Demonstrate how to distinguish science from pseudoscience by scientifically evaluating a wide variety of extraordinary claims that are common in our culture today.

Just as importantly, upon completion of this course, we hope that you will have a greater appreciation of the role of science in all of our lives and the need for scientific literacy and critical thinking to help make informed decisions about issues currently facing our society.

Methods of Instruction: This course is based on a combination of traditional lecture format, coupled with the use of "**case studies**" which involve classroom-based group work, class discussions, homework assignments, and readings. The use of case studies (which are stories with an educational purpose) has been shown to: significantly increase student interest, enjoyment, and involvement with a course; improve grades; and enhance students' critical thinking ability.

Students are required to take the lab concurrently because the lecture and lab constitute a single course. The lab is also based on the use of case studies.

Course Materials: There are two textbooks for the course and a lab manual. The first book listed below (Foundations of Science) is an integrated science text that provides the scientific knowledge for the course. The second text (How to Think about Weird Things) provides an understanding of how to use both critical thinking and scientific reasoning to evaluate extraordinary/weird claims.

1) ***Foundations of Science - Custom*** (This is a custom edition of *Conceptual Integrated Science*, by Hewitt, Lyons, Suchocki, and Yeh, 2012), Pearson/Addison-Wesley, San Francisco. ISBN 9781269685535

2) ***How to Think About Weird Things: Citical Thinking for a New Age*** – 7e, 2013, by Theodore Schick and Lewis Vaughn, McGraw-Hill. ISBN 9780078038365 (paperback).

3) **Lab manual: *Foundations of Science Lab Manual*** ISBN 9780738085241

Scantrons: You will need 3 of the "long" Scantron test forms (the 100-question version; 50 on front and 50 on back [form #882-E])

Supplementary Readings: If used, these will be distributed either in class or placed on BlackBoard.

Grading Criteria

Because the lecture and lab portions of the course are considered to be part of the *same* course, the final course grade is based on a combination of lecture tests, lecture coursework, *and* lab work. In other words, there is no separate lab grade. Specifically, the lecture tests constitute 46.4% of the grade, the lecture assignments constitute 29.5%, and the lab assignments constitute 24.1%. Because of this, students must remain enrolled in both the lecture and lab for the entire semester; they cannot drop either the lecture or the lab and receive a grade for the course. The 4 in the 1436 designation for the course indicates that this is a 4-credit course that has a lab component.

Grading will be based on 3 lecture exams (including the final), nine (9) sets of reading questions, 3 group case study activities, 3 group homework assignments, individual and group lab quiz grades, peer evaluations by your fellow group members in both lecture and lab (see details below), a syllabus quiz, and attendance.

Please note that the number of assignments may be changed slightly (e.g., add or drop a homework assignment) if circumstances warrant such a change. If this happens, it will have a slight effect on the percentage points associated with each aspect of the course.

In an integrated course such as this, each topic serves as the foundation for subsequent material; consequently, **students should remember and understand all of the basic principles covered previously in the course** in order to apply them in the case studies and labs, and to do well on exams.

Tests: There are 3 major exams and each will consist of multiple-choice, matching, essay, and short answer-type questions, and will be worth 730 points. (Don't panic! There won't be 365 two-point questions – just a standard number of questions). Tests total 2,190 points and constitute 46.4% of the total course grade.

Reading Quizzes: Each week, you will be assigned readings from the books listed above and, in some cases, from PowerPoint lectures that are posted on BlackBoard but which are not discussed in class. To ensure that students read these assignments, **a set of reading questions will normally be given every two weeks over the reading material**. These assignments will be ***completed outside of class* online, in BlackBoard.** You are asked to *use both your books and notes* to complete the assignments. Once available, you may re-take the reading quiz assignment as many times as you wish before the due date for the reading assignment. If you experience computer problems, please contact the online helpdesk (936-294-2780) before the assignment is due. The reading quizzes will be available for a week, or more, before they are due. **They can be retaken as many times as you want before the due date and it is the highest score that is accepted**. The quizzes are randomly created from a pool of questions. The pool typically consists of 60 to 90 questions. Because the computer randomly selects questions from the question pool when it generates a quiz, each version of the quiz will be different and may consist of some questions that are repeated, as well as new questions. The more times you take it, the more questions you will see before the test. We suggest you complete the reading quizzes early, should you have questions or computer problems. Because the reading quizzes are available for an extended period of time and can be re-taken before the due date, ***late reading quizzes will not be accepted***. We do not recommend waiting to the last available day to complete the reading quizzes, as you may experience computer and/or technical issues. By attempting the quizzes earlier in the week, you will ensure you earn a higher grade and submit the assignment on time.

As regards the reading assignments, **I strongly recommend that you thoroughly read the material – don't just skim it**. **If you try to avoid actually reading the material and, instead, merely skim the chapter until you find something that 'looks right,' you will *not* learn the material. This technique really doesn't work because, as emphasized throughout the course, facts presented in isolation from one another don't make sense. You have to see the connections among the facts in order to make sense of them – and to remember them! This is why reading *all* of the material for comprehension does work!**

Pacing your work is the key to not being overwhelmed!

Once the quizzes have been submitted, the answers will be posted on BB. A screen will show you which questions you earned credit on and which you missed. In many cases, explanations are provided for the answers as well. Many students print off their completion reports for study guides. Please remember that this course is about ***understanding and reasoning – not memorization***. So, you should always look over the completion reports to ensure that you understand the concepts. **In other words, the quizzes and completion reports serve as a study guide for the readings.**

There are a total of **570** points possible for these quizzes, including 20 points for the **syllabus quiz**. Together, these are worth **12%** of the course grade.

Case Studies and Peer Evaluation

In this class, students will be divided into groups by the instructor in such a way as to ensure maximum diversity in the group. Each group will consist of about 4 students who will work together throughout the semester on both case studies and the three group homework assignments that will be completed outside of class. As you will see, **group scores are usually better than individual scores, and so this process normally *improves* an individual's grade**. In addition, ***group effort helps everyone learn the material better because everyone is involved in teaching one another***. So, individuals normally do better on tests as a result of this prior group preparation process – assuming they put in the effort. Group work in lecture constitutes 12.3% of the total course grade. Groups also will be formed in lab, and group work in lab constitutes 9.5% of the total course grade. **So**, **in total**, **group scores comprise 21.8% of one's grade in the course**.

Many students are initially uneasy about the idea of working in groups because it is often the case that, in previous classes, some members of their group did all or most of the work, while others did little or nothing – but everyone received an equivalent grade. This should **not be a problem** in this course because of the importance of group peer evaluation procedures to a student's grade. The procedures for performing peer evaluations are described below.

Peer Evaluation Process

You will evaluate each of your group members, including yourself, on a 10 point scale. (0=no work, 10=full participation) Please note that 10 is the maximum number of points that may be awarded.

You must be fair in your assessments, but if someone in your group did not contribute adequately, then you should give them fewer points. **If they were not present or did not contribute to an assignment, they should receive zero points.**

It is imperative that you assign these scores **PRIVATELY** (NOT in front of your team members) AND that you do this on the day the case study was conducted or the assignment turned in! **It is also critically important that you do not 'agree' to give each other good scores. This is guaranteed to undermine the integrity of the process and will inevitably result in bad feelings if someone in the group doesn't do his or her fair share of the work because he or she thinks they're going to get a good score no matter what they do.**

At the end of the semester, your peer evaluation score is equal to the average of the amount of peer evaluation points you received from the members of your group - converted to a percent. Accordingly, an average of 10 points equals 100%; an average of 90 equals 90%, and so on. This score is then used to determine the number of *group* points that you will receive at the end of the semester. If you receive an average of 10, you will receive 100% of the points earned by your group on the group assignments. If you receive an average of 9.2, then you will receive 92% of the group points, and so on.

If you have an average of less than 7, you will not receive ANY of the group points.

Use the following additional criteria when assigning points:

1) Be fair! If a person made a genuine effort to contribute, then award 10. ***Do not give points to a student for an assignment if that student was absent*** *the day a group assignment was done in class. And, do not give any points on a group homework assignment if the person did not contribute. You will lose points if it you award points to group-members that did not contribute.*

2) You cannot give anyone in your group more than 10 points. (This prevents people from giving their friends an unfairly large amount of points, which would necessarily hurt other members of the group because there would be less points to distribute to other group members).

3) **You do not have to distribute all of the points**. If someone does not contribute appropriately, then give him or her less than 10 points. And, as stated previously, if someone is absent in your group on the day of the assignment, then give him/her no points; i.e., a zero.

4) **Anyone receiving an average of less than 7.0 on his or her peer evaluation at the end of the semester will automatically lose his or her group-based points.** So, for example, if a student receives an average of less than 7.0 in lecture, the student will lose all of the group-based points earned by the group in lecture. This amounts to a maximum 600 points out of 4000 possible in the course and constitutes 15% of the total course grade. In the same way, if a student receives an average of less than 7.0 on his or her peer evaluation in lab, the student will lose all of the group-based points in lab, which is a maximum of 400 points. This equals 10% of the total course grade. And, if a student received less than 7.0 in *both* lecture and lab, they would lose up to 25% of the total course points; i.e., more than 2 letter grades. The point is, **"Do your best to contribute to the group☺!"**

5) Failure to peer evaluate correctly (and/or on-time) results in the loss of 40 points from the overall set of course points.

It is the last rule that normally ensures everyone will contribute to the group's efforts! Also, the fact that the score is an average prevents anyone who might be unfair in the awarding of points from single-handedly undermining the final grade of a group member. ***I have the option of adjusting and/or ignore a score should it not reflect your effort.*** In fact, I can override a low average score if there is evidence that the grade was unfairly assigned by the group.

This type of peer-evaluation method has been used in many universities and works very well. Students like it because it encourages everyone to pull their own weight and contribute to the group.

Example: Imagine that a student named Linda received peer evaluation amounts in lecture of 8, 10, 9, 10, and 10, for a total of 47, which is an average of 9.4, or 94%. John received all 10s and so received all of the group points. Billy, who skipped class, didn't sit with his group, and contributed very little to the group, received scores of 2, 0, 3, 0, and 2 for a total of 7 points and an average of 1.4, or 14%. So, Linda received 92% of the group's overall grade for the semester. With an average of 14%, poor Billy lost 580 points, which means his overall course grade dropped by 1.2 letter grades. And, because his average was 71% before the deduction, Billy failed the course (71% - 12.2% = 58.8%). This is not the happy ending any of us wants to see!

How to Earn a Good Peer Evaluation Score

1) Sit with your group every day and learn everyone's names. Get to know them.

2) Come prepared to contribute to the case studies and quizzes by attending all classes (so you know what's going on), and reading the assigned material. In other words, make sure you can and do contribute constructively to the discussions.

3) Be positive and friendly and treat the other members of the group the way you want to be treated. In other words, be courteous and respectful of others' comments and ideas - even if you don't agree with them. Be willing to accept that your initial thoughts might be incorrect, but also don't be afraid to courteously express your views even if they are different from those of others in the group.

4) Contribute significantly to the group homework assignments. Do your part and do it on time – not at the last minute. * You should keep a copy of what you have written in case there is a dispute regarding your contribution. Remember, I can override the group's evaluation in the unlikely event that it was unfair. ***However, this normally requires that you be able to document what you contributed so that I can base my decision on evidence rather than hearsay***.

5) Come to any and all group meetings and, if you absolutely cannot be at a meeting because of work or other legitimate schedule conflicts, make sure you keep in touch with the group via e-mail, Facebook, or phone and let them know ***ahead of time*** that you can't come. Most people will understand if they know someone has legitimate reasons for not attending a meeting. But, you need to contribute ideas, written material, etc., even if you can't join the group in person.

An initial, trial peer evaluation will be done approximately half way through the semester. This evaluation will NOT count as part of the grade and will serve only to give each person feedback from the members of his or her group so that he or she can correct any problems that might exist.

Very important note: Although points are not given for completing peer evaluations, points will be deducted if the rules described above were not followed and/or if you do not submit a peer evaluation for your group members. Specifically, 40 points will be deducted for not submitting a peer evaluation when it is requested. So, please do the evaluation!

Homework Assignments

There will be **three *group*** homework assignments worth a total of 400 points (10% of course grade). These assignments entail analyses of actual arguments and claims. For example, the first assignment involves evaluating a series of arguments. The second assignment entails an analysis of a product that is available to "help maintain your health". The question your group will try to answer is, "Does it work?" "Is it based on science or pseudoscience?" Doing these assignments will help you evaluate the innumerable claims you will encounter in your life.

The third assignment is known as FiLCHeRS and is worth 200 points. This assignment involves the application of the FiLCHeRS rules (which are discussed in class) to an analysis of an extraordinary claim you will be assigned to evaluate. The assignment consists of both multiple choice and short answer questions and is a ***capstone*** assignment in that it entails using information learned *throughout* the course to evaluate the claim.

Attendance and Make-up Policies

This course abides by University Policy and Regulations concerning attendance (See the Undergraduate Catalog). Accordingly, "regular and punctual attendance" is expected of each student at Sam Houston State University:

In a course such as this, in which group effort is a significant part of the grade, students genuinely need to come to class so that they can contribute to their group's success. Those who are prepared and contribute positively will be highly valued by their group! This course also moves quickly and many ideas build on one another and are used throughout the course. So, if a student misses class, he or she will almost certainly be hurt academically. In short, attendance matters and *is required*.

Because attendance is so important, I give each student 200 points at the beginning of the semester. Although this is part of the total points possible for the course, it is non-academic (i.e., not dependent on tests and assignments) and so serves as a *grade cushion*. All you have to do to keep these points is to come to class. How much easier can it get! However, because attendance *is* so important, ***students will lose 100 points for each unexcused absence after the second absence***. (In order for an absence to be *excused*, some form of documentation must be provided to show that it was legitimate; this can include a physician's note, a funeral announcement, legal notice, etc. The documentation must be provided within **one week** of returning to class.) Also, tardies can be counted as absences. So, if a student misses 6 times, is tardy 6 times, or has some combination thereof (e.g., three unexcused absences and three tardies), he or she will lose 480 points from their overall grade.

If someone misses more than 6 times, that student automatically FAILS THE COURSE

So, please come to class!

Examples

0-2 absences/tardies – no point deduction
3 absences/tardies – 100 points (-2.5% of grade)
4 absences/tardies – 200 points (-5.0%)
5 absences/tardies – 300 points (-7.5%)
6 absences/tardies – 400 points (-10%)
> 6 absences/tardies = F

Please understand that these policies are intended to prevent students from failing the class because of skipping so many classes that they can't learn the material. In effect, these attendance rules keep most students on track and reduces the number of students that might otherwise fail the course.

1. In addition to the required attendance/tardy policy, it is important that you stay for the entire class -- **please do not leave the classroom early** unless you are sick or have cleared it with me before class begins**. Students can be counted absent if they leave the class early without permission.**

2. If you know you will miss a class (because of an excusable event, such as an "away" baseball game and you are a member of SHSU's baseball team), **provide me with documentation** ahead of time and we can make arrangements for a make-up exam.

   If, for whatever reason, you **miss an exam**, please contact me as soon as possible to determine if and when the exam may be made-up. Make-up exercises and exams are only allowed based on my approval, and only if you have contacted me within a reasonable amount of time (one day!) following the absence.

3. **Late Work Policy: Late work will not be accepted.**

   Please check BlackBoard as soon as the grades are posted. **Students have a maximum of two weeks to contest a grade**. For example, if the grade is incorrect, you need to notify me within two weeks of my posting of the grade. After two weeks, if no errors have been reported to me, the grade stands as is.

What happens if you miss a Case Study? If you miss a case study in lecture because of an excused absence, you can partially make it up by completing it on your own. This will entail writing an essay response to any questions that may have been asked in class regarding the case, as well as taking the quiz over the case study**. The maximum score that a student can achieve is the score earned on the assignment, OR the group's score – whichever is *lower*.** This policy ensures that your grade is tied to the group grade, but it also provides some grade 'cushion' for those that may be sick or unable to come to class on the day of the case study, while also discouraging students from simply skipping the day of a case study. ***Please remember that your group must (based on the rules for peer evaluations) give you a zero for group participation on the case study if you are absent.***

Lab Grades

The lab grade will consist of both individual scores and group-derived scores. Most of the labs will be based on case studies that will involve instructor-led discussions in which members of groups work together to develop responses, propose hypotheses and experimental designs, or offer explanations for what has been reported or observed. In short, labs involve a lot of discussion – both within each group and among groups. The lab instructor will facilitate these discussions. The discussions make the labs fun and interesting because they are not based simply on rote memorization and fill-in-the-blank activities; rather, they involve group discussion and exploration of topics.

At the beginning of the lab, each student will be given a short, Individual Lab Quiz (ILQ) over the information provided in the lab readings and relevant readings assigned in lecture. This is intended to ensure that everyone reads the ***lab exercise and textbook background readings*** (listed on the lecture syllabus) ***before coming to class so*** they will be prepared for the lab discussion. The quiz will include some vocabulary terms listed at the end of the lab exercise and related lecture notes and readings. Questions will be multiple-choice and/or short answer essay.

At the end of the lab, each group will be given a Group Lab Quiz (GLQ) regarding the information covered in lab. The group will work together as a team to complete it. Groups will be created by the lab instructor at the beginning of the year. The purpose for the group work is to enhance understanding of the material by having group members help teach each other the material and reinforce the key concepts covered in the lab. The group scores obtained over the semester will be adjusted by the peer evaluation score the student receives from his/her peers using the procedures outlined on the peer evaluation form. Failure to peer evaluate correctly results in a loss of overall course points.

A total of 10 lab case studies will be completed and **students will be allowed to drop both their lowest individual lab quiz (ILQ) and their lowest group lab quiz (GLQ) grade.** Accordingly, the lab quizzes, both individual and group, total 1000 points. These points will account for 25% of your overall course grade.

In summary, students can earn 600 *individual* points and 400 *group* points. **Please remember that, in this course, the lecture and lab grades *are combined* to determine your overall course grade.** Thus, there is a total of 1000 lab points possible in lab.

Grade Determination

Your grade is based on the percentage of points earned relative to the maximum number possible for the course (4,000). The percentage of the total possible points determined by individual effort is 75% (3000 out of 4000 possible), and that determined by group effort is 25% (1000 out of 4000 possible). So, although group effort is fundamentally important to the design of the course and to the way in which labs and case studies are run, **your grade is determined *primarily* by your individual scores; i.e., by your individual effort**. In short, you are ultimately responsible for the majority of the grade points you earn in the course. **The group work should help you *do better* by helping you learn the material more thoroughly**.

Please note that The State of Texas REQUIRES that universities have students engage in group activities because it is crucial to their career preparation. This is an additional reason why group work is required and why you will evaluate one another's contributions to the group.

All of the tests and assignments for the course, including lab assignments, are listed in the **Score Sheet found in BlackBoard**. To keep track of your grades, **you need to record each and every grade you receive on this sheet**. (***Please note that Black Board will not calculate your grade***; ***it's simply a place to store the grades for individual assignments***.)

Point range for final course grade

A = 3580-4000	D = 2380-2780
B = 3180-3580	F = less than 2380
C = 2780-3180	

Academic Honesty: All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action that is consistent with university policies. Please read the following:

Students are encouraged to study in groups to prepare for tests. However, "group effort" is definitely not permitted when taking exams! This will result in an automatic zero on a test. Two such occurrences will result in an F in the course.

Proper Course Behavior: All of these rules are standard and are based on common courtesy, respect, and honesty – all of which are necessary to ensure a positive learning environment.

1) Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. Cellular telephones, pagers and ALL other electronic communication devices must be turned off before class begins.

   Students are prohibited from eating or drinking in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom will result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

2) ***Please do not use cell phones, laptops, I-pods, or other unapproved electronic device in class at any time, unless instructed to do so, because it distracts not only you, but the instructor and other students.***

   If you have an emergency-type situation that requires that you be in cell phone contact with someone (e.g., spouse is delivering, your kidney transplant imminent), then please consult with me before class begins so we can discern the best course of action.

3) **Please come to class on time**—there is no reason to be late to class on a frequent basis**.**

4) **Please remain in class until it is finished** because **leaving early disrupts the class and will count as an absence unless you have cleared it with me, or unless it is an emergency**. If you have a job that overlaps with class time, then you need to drop the course or change your work schedule.

5) Please remove hats during exams.

6) **For obvious reasons, students CANNOT LEAVE THE ROOM DURNING AN EXAM and then return**. If this happens, the test will be taken up and your grade will be based on the portion of the test that you completed. **If you have a cold or allergy, please bring tissues to class so that you won't want to leave to get tissues during the test.**

Study Tips: Please read and follow these tips to enhance your grade in the course. I want you to do well!

1. **This course deals with arguments and evidence for or against certain claims. So, in order to study, you should imagine that you have been asked to write an essay in which you must present evidence and arguments to either support or refute a claim. This helps you learn and retain the material – and it makes the learning process more fun and interesting. This approach amounts to pretending that you are teaching the material to someone else.** You cannot simply memorize your notes and definitions and expect to do well on the tests. You must truly understand the material in order to obtain a good grade.

2. **Take notes.** Taking requires active listening; i.e., a conscious attempt to determine what is important and to look for connections between ideas. Lectures aren't simply a bunch of facts and definitions thrown together. **In the class, the lectures are arguments either for or against certain claims and you'll need to understand the arguments**.

3. **Review your notes before the next class.** Constant reviewing will help you learn the material in smaller 'bites' of information – which makes it much easier to learn. Just as importantly, reviewing your notes before the next lecture will help you see how the previous material connects with the material to be covered in the upcoming class.

4. This course requires that students learn a significant amount of material on their own, independent from the lecture material. Furthermore, the reading quizzes are based on the reading material! **So, reading the textbooks and reader for this course really, truly is a necessity. *The ability to learn on your own is one of the most important skills you will learn in college, and it is one of the most important skills that employers look for in job candidates.***

5. When it comes time to **review for an exam**, first read the highlighted portions of the text, then concentrate on your notes. You might also want to follow the procedures below:

   a. As you review your notes, first concentrate on absorbing the key ideas and understanding the organization of the material - why certain ideas followed others in the class and how they are related.

   b. Once this is done, begin to focus on the details - the "whys." As stated above, **tests in this course are absolutely not based on the mere memorization of definitions, or on the recognition of verbatim statements from lecture**; rather, the test questions assume you already know the definitions and that you understand the concepts discussed in lecture. **So, you will not be asked definitions; rather you will be asked to apply facts and principles, i.e., to think with the information you have learned**. Of course, you have to know the definitions to begin the process of answering questions; so, by all means, learn the definitions as the first step in learning the material☺

Visitors in the Classroom: Unannounced visitors to the classroom must present a current, official SHSU identification card to be permitted in the classroom. They must not present a disruption to the class by their attendance. If the visitor is not a registered student, it is at the instructor's discretion whether or not the visitor will be allowed to remain in the classroom. This policy is not intended to discourage occasional visiting of classes by responsible persons.

Americans with Disabilities Act: It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see:
http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf

Religious Holy Days: If a student desires to be excused from class, assignment, or a test on a religious holy day, then the student must notify the instructor of each scheduled class that he/she will be absent for religious reasons. In such cases, the student will be required to take the test or submit the assignment early—unless there are good reasons for not being able to do so and the instructor has agreed to those reasons.

Special Circumstances: If unusual circumstances arise during the semester, such as a medical problem, death in the family, etc., which adversely affects your attendance **PLEASE discuss this with me immediately and provide documentation**. **Don't wait until the end of the semester to discuss the problem with me.** If you keep me informed, I will gladly do my best to accommodate your situation. However, please understand that, because of the nature of the course, there are limits as to how much can be excused and so, at some point, it may be necessary for you to drop the course. Also, if you wait until after-the-fact, at the end of the semester, to let me know that you were experiencing these adverse circumstances, there is nothing I can do about it at that time. I cannot retroactively make accommodations and I do not give extra credit assignments to make up for grade deficiencies.

SCHEDULE: **This schedule is subject to change at any time* based on class progress.
Major lecture topics are listed in bold-face, black font.

Please note that some of the readings include only sections of a chapter (indicated by the word "part"), whereas others include the entire chapter, indicated by the word "all". Please don't wait until the last minute to do the readings!

Tentative Schedule (Tuesday/ Thursday)

Week	Lectures/ Reading/RQs/ CaseStudies/ Homework/Tests
1st 1/18	**Introduction** and **Witch Trials** Lecture Read Schick – Chapter 1 all: "Close Encounters with the Strange" pp. 1-13 Read FOS - Chapter 1 all: "About Science" pp. 1-14
2nd 1/23	Begin **Nature of Science** lecture Read Schick – Chapter 6: "Science and Its Pretenders" pp. 158-181 Read Schick – Chapter 3: "Arguments Good, Bad and Weird" parts 33-39 and 49-57
1/25	Continue **Nature of Science** lecture ***Argument Homework Assigned*** ***Form groups*** ***Group Norms Activity*** **Syllabus Quiz due** **Reading Quiz 1 due**
3rd 1/30	Continue **Nature of Science** lecture Read Schick Chapter 4: "Knowledge, Belief and Evidence" parts 62-84 and summary on page 90
2/01	***Group Norms Activity- Due*** Finish **Nature of Science** lecture **Reading Quiz 2 due**
4th 2/06	Begin **Limits to Perception and Memory** Lecture
2/08	Continue **Limits to Perception and Memory** Lecture Read Schick Chapter 5: "Looking for Truth in Personal Experience" part 96-143 (perception and memory problems) **Reading Quiz 3 due**
5th 2/13	Finish **Limits to Perception and Memory** Lecture
2/15	***Xango Case Study*** Read FOS Chapter 2 all: "The Universe" pp. 15- 34 ***Argument Homework due***

6th 2/20	**Test 1**
2/22	Begin **Astronomy** Lecture Read FOS Chapter 3: "The Atom"35-56 Read FOS Chapter 4: "Energy and Momentum" 57-76
7th 2/27	Continue **Astronomy** Lecture Read Schick Chapter 4: "Knowledge, Belief and Evidence" part 84-90 (astrology section)
3/01	Continue **Astronomy** Lecture Read Schick Chapter 7: "Case Studies in the Extraordinary" part 234-248 Read FOS Chapter 5 "Heat" 77-98 Read the *"Laws and Relativity"* lecture on BlackBoard **Reading Quiz 4 due**
8th 3/06	Finish **Astronomy** Lecture Read FOS Chapter 6: "Describing Motion" 99-116
3/08	Begin **Physics & Paranormal** Lecture Read Power Point lecture on Black Board titled "The Paranormal – Part 1: History of Ghosts, Psychic Energy, Psychic Powers, Psychic Detectives, Psychic Healers and Mediums." Read FOS Chapter 7: "Newton's Laws of Motion" 117-138
3/12-3/16	**Spring Break**
9th 3/20	Continue **Physics & Paranormal** Lecture Read Schick Chapter 2 all: "The Possibility of the Impossible" pp. 14-29 (the possibility of ESP and precognition) Read Schick Chapter 6: "Science and Its Pretenders" part 197-213 (parapsychology)
3/22	Continue **Physics & Paranormal** Lecture ***AAW Water Homework assigned*** Read Schick Chapter 7: "Case Studies in the Extraordinary" parts 220-227 and 248-276 (talking to the dead, near-death experiences, and ghosts) **Reading Quiz 5 due**
10th 3/27	**Test 2**
3/29	Begin **CAM** lecture Read Schick Chapter 7 (homeopathy) part 227-231
3/30	**Good Friday**

11th 4/03	Continue **CAM** lecture Read Schick Chapter 5 “Looking for Truth in Personal Experience” part 141-150 (anecdotal evidence, placebo effects and controlled studies) Read FOS Chapter 8: "Human Biology – Care and Maintenance" 139-160
4/05	Continue **CAM** lecture **Reading Quiz 6 due**
13th 4/10	***Vaccine-Autism Case Study*** Read FOS Chapter 9: “Rocks and Minerals parts 161-184 Read FOS Chapter 10: “Plate Tectonics” pp. 185-210 ***AAWater Individual Homework due***
4/12	Begin **Geology** Lecture Read FOS Chapter 11 all: “The Solar System” pp. 211-232 **Reading Quiz 7 due**
14th 4/17	Geology Lecture
4/19	Finish **Geology** Lecture/ Complete “**Cryptozoology**” Lecture ***AAWater Group Homework due*** ***FiLCHeRS Homework assigned*** Read FOS Chapter 12: "The Basic Unit of Life – the Cell" pp. 233-260 Read FOS Chapter 13 all: "Genetics" -- pp. 261-286 Read Schick Chapter 8 all: "Relativism, Truth and Reality” pp. 295-315
15th 4/24	Begin **Genetics** Lecture Read FOS Chapter 14 all: "Evolution” -- pp. 287-316 Read Schick Chapter 6: “Science and Its Pretenders” part 181-197 **Reading Quiz 8 due**
4/26	Continue **Evolution** Lecture
16th 5/01	Continue **Evolution** Lecture **Reading Quiz 9 due**
5/03	Finish **Evolution** Lecture ***FiLCHeRS Homework due***
17th **5/07-5/10**	**Test 3** **1436.02- 5/10- 12:00-2:00** **1436.06- 5/08- 3:30-5:30**

Tentative Schedule (Monday/Wednesday/Friday)

Week	Lectures/ Reading/RQs/ CaseStudies/ Homework/Tests
1st 1/17	Campus Closed
1/19	**Introduction** and **Witch Trials** Lecture Read Schick – Chapter 1 all: "Close Encounters with the Strange" pp. 1-13 Read FOS - Chapter 1 all: "About Science" pp. 1-14
2nd 1/22	Finish Witch Trials Begin **Nature of Science** lecture Read Schick – Chapter 6: "Science and Its Pretenders" pp. 158-181 Read Schick – Chapter 3: "Arguments Good, Bad and Weird" parts 33-39 and 49-57
1/24	**Continue Nature of Science** **Syllabus Quiz due** **Reading Quiz 1 due**
1/26	Continue **Nature of Science** lecture ***Argument Homework Assigned*** ***Form groups*** ***Group Norms Activity***
3rd 1/29	Continue **Nature of Science** lecture Read Schick Chapter 4: "Knowledge, Belief and Evidence" parts 62-84 and summary on page 90
1/31	Finish **Nature of Science** lecture ***Group Norms Activity- Due*** **Reading Quiz 2 due**
2/02	Begin **Limits to Perception and Memory** Lecture
4th 2/05	Continue **Limits to Perception and Memory** Lecture Read Schick Chapter 5: "Looking for Truth in Personal Experience" part 96-143 (perception and memory problems)
2/07	Continue **Limits to Perception and Memory** Lecture **Reading Quiz 3 due**
2/09	Finish **Limits to Perception and Memory** Lecture
5th 2/12	***Xango Case Study***
2/14	***Finish- Xango Case Study*** Read FOS Chapter 2 all: "The Universe" pp. 15- 34 ***Argument Homework due***
2/16	Finish Up

6th 2/19	**Test 1**
2/21	Begin **Astronomy** Lecture Read FOS Chapter 3: "The Atom"35-56 Read FOS Chapter 4: "Energy and Momentum" 57-76
2/23	Continue **Astronomy** Lecture Read Schick Chapter 4: "Knowledge, Belief and Evidence" part 84-90 astrology section
7th 2/26	Continue **Astronomy** Lecture Read Schick Chapter 7: "Case Studies in the Extraordinary" part 234-248 Read FOS Chapter 5 "Heat" 77-98 Read the "*Laws and Relativity"* lecture on BlackBoard
2/28	Continue **Astronomy** Lecture **Reading Quiz 4 due**
3/02	Finish **Astronomy** Lecture
8th 3/05	Begin **Physics & Paranormal** Lecture Read FOS Chapter 6: "Describing Motion" 99-116
3/07	Continue **Physics & Paranormal** Lecture Read Power Point lecture on Black Board titled "The Paranormal – Part 1: History of Ghosts, Psychic Energy, Psychic Powers, Psychic Detectives, Psychic Healers and Mediums." Read FOS Chapter 7: "Newton's Laws of Motion" 117-138
3/09	Continue **Physics & Paranormal** Lecture
3/12-3/16	**Spring Break**
9th 3/19	Continue **Physics & Paranormal** Lecture Read Schick Chapter 2 all: "The Possibility of the Impossible" pp. 14-29 (the possibility of ESP and precognition) Read Schick Chapter 6: "Science and Its Pretenders" part 197-213 (parapsychology)
3/21	Continue **Physics & Paranormal** Lecture ***AAW Water Homework assigned*** Read Schick Chapter 7: "Case Studies in the Extraordinary" parts 220-227 and 248-276 (talking to the dead, near-death experiences, and ghosts) **Reading Quiz 5 due**
3/23	Finish Up
10th 3/26	**Test 2**
3/28	Begin **CAM** lecture Read Schick Chapter 7 (homeopathy) part 227-231
3/30	**Good Friday** Read Schick Chapter 5 "Looking for Truth in Personal Experience" part 141-150 (anecdotal evidence, placebo effects and controlled studies)

11th 4/02	Continue **CAM** lecture Read FOS Chapter 8: "Human Biology – Care and Maintenance" 139-160
4/04	Continue **CAM** lecture **Reading Quiz 6 due**
4/06	Finish CAM lecture
13th 4/09	***Vaccine-Autism Case Study*** Read FOS Chapter 9: "Rocks and Minerals parts 161-184 Read FOS Chapter 10: "Plate Tectonics" pp. 185-210
4/11	***Finish- Vaccine-Autism Case Study*** ***AAWater Individual Homework due*** Read FOS Chapter 11 all: "The Solar System" pp. 211-232
4/13	Begin **Geology** Lecture **Reading Quiz 7 due**
14th 4/16	Geology Lecture
4/18	Continue **Geology** Lecture/ Complete "**Cryptozoology**" Lecture ***AAWater Group Homework due*** ***FiLCHeRS Homework assigned*** Read FOS Chapter 12: "The Basic Unit of Life – the Cell" pp. 233-260 Read FOS Chapter 13 all: "Genetics" -- pp. 261-286
4/20	Continue **Geology** Lecture/ Complete "**Cryptozoology**" Lecture Read Schick Chapter 8 all: "Relativism, Truth and Reality" pp. 295-315
15th 4/23	Begin **Genetics** Lecture Read FOS Chapter 14 all: "Evolution" -- pp. 287-316 Read Schick Chapter 6: "Science and Its Pretenders" part 181-197
4/25	**Continue Genetics/ Begin Evolution** **Reading Quiz 8 due**
4/27	Continue **Evolution** Lecture
16th 4/30	Continue **Evolution** Lecture
5/02	Finish **Evolution** Lecture ***FiLCHeRS Homework due*** **Reading Quiz 9 due**
5/04	Finish Up
17th **5/07-5/10**	**Test 3** **1436.24- 5/09- 9:30-11:30** **1436.40- 5/09- 2:30-4:30**