PART I – Course Information

Course Type
☒ Existing/Restructured
☐ New Course Proposed Fall 2013

If new, have you submitted a Form B to the SHSU Curriculum Committee? ☐ Yes ☐ No

Course Prefix & Number: BIOL, GEOG, GEOL 1436

Texas Common Course Number (TCCN Matrix): NA

Course Title: Foundations of Science

Course Catalog Description (Copy and paste from online catalog for existing courses):
The course focuses on the nature of science as a reliable method of acquiring knowledge about
the natural world. Students will learn how to apply key scientific facts, concepts, laws and
theories to distinguish science from non-science, bad science, and pseudoscience by
analyzing a variety of claims and case studies. By employing an innovative, interdisciplinary
approach to science education, this course is designed to increase science literacy and critical
thinking skills for introductory-level students. This course is designed for non-science majors to
help them meet their General Education science requirement. Students must enroll concurrently
in the corresponding lab for this course. Credit: 4

Course Prerequisites: None

Available Online?
☐ Yes, currently developed in online delivery mode
☐ Anticipated development in online delivery mode (Semester, Year: ___)
☒ No

Number of Sections to be Offered per Academic Year: 10-12

Estimated Enrollment per Section: 55-60

Course Level (freshman, sophomore): Freshman

Designated Contact Person (for follow-up communication purposes): Dr. Marcus Gillespie

E-Mail Address: marcusg@shsu.edu

Phone: 294-1945

Approvals

Department Chair: [Signature] 10/16/12

Academic Dean: [Signature] 10/19/12

Submit completed, signed form to Core Curriculum Committee - Box 2478 or Fax 4-1271
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PART II – THECB Foundational Component Areas

See Appendix for full description of each component area.

Select Component Area: III. Life and Physical Sciences

In one paragraph, describe how the proposed course will fulfill the core and skill objectives of the component area: This course is an integrated science course that emphasizes key concepts and theories from several branches of science. In addition, and perhaps most importantly, the course simultaneously focuses on the nature of science as a way of knowing that is reliable because of its methodology, which is intended to minimize error through the use of evidence and reason. It specifically emphasizes critical thinking skills (one of the 2 textbooks for the course is a text on critical thinking), empiricism, skepticism, and the scientific method. The course uses case studies and problem-based learning which require teamwork, as well as oral, written, and visual communication. All lab activities are based on group work and the peer evaluation system ensures that students participate as team members. The course also addresses quantitative skills and graph interpretation skills through the use of problems and lab activities.

PART III – Course Objectives & Student Learning Outcomes (SLO)

Insert the applicable course objectives stated as student learning outcomes (e.g., Students completing the course will be able to...) that support the core component area objectives. Please reference the component rubric for additional information on core component area objectives.

Objective/SLO 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.

How will the objective be addressed (including strategies and techniques)? This material is covered explicitly and in depth in both the lecture and lab components of the course. The concepts of scientific laws, theories, and hypotheses form the framework for much of the course and are referenced continuously in the context of lecture discussion and activities designed to help students understand key scientific laws (gravity, thermodynamics, Kepler’s Laws of Planetary motion, Newton’s laws, etc), as well as scientific theories (Big Bang, Plate Tectonics, Evolution). The criteria for scientific theories are emphasized and are used to evaluate both scientific and non-scientific (pseudoscientific) theories and claims. Students use these concepts to evaluate a variety of claims to determine if the claims meet the criteria for a scientific claim. Control groups, placebo groups, and double blind studies are discussed in depth as a means of helping students understand why they are necessary to help eliminate errors regarding claims, especially those pertaining to the alleged efficacy of a variety of health products. This discussion occurs in the context of a discussion of the FDA approval process and alternative medicines (which are typically not tested using these experimental procedures). The concept of potential bias (in many of its forms) occurs throughout the course and is intended to
help students understand why the scientific method is necessary to eliminate bias and errors and to help students avoid them in their daily life. Students use all of these concepts in case studies in both lecture and lab activities.

Describe how the objective will be assessed: This is assessed using a variety of methods in the course, the most important of which is the Critical Thinking Assessment Test (CAT) which was developed by six universities, primarily Tennessee Tech University (TTU), and was supported by the National Science Foundation. The test is used by more than 120 universities and schools in the U.S. The test is scored by a team of faculty members at SHSU and the results are then sent to TTU for analysis. TTU then prepares an institutional report which compares our results with other universities which use the exam. The exam measures a variety of things which map onto the objectives of this course. This is why it is used as the primary assessment instrument for many of our objectives. We also use a locally-developed instrument called the Foundations of Science Exam (FSE). This exam, which was Beta-tested by the Office of Institutional Research, consists of several parts which measure knowledge of basic scientific facts, knowledge of scientific terminology, and critical thinking. In addition, we use the Measure of the Acceptance of the Theory of Evolution (MATE) survey which, by measuring students' attitudes toward evolution - one of the most important theories in science - correlates with students' understanding of science as a reliable way of knowing, and their understanding of what a scientific theory actually is. In addition, the course uses case studies in lecture and lab, homework assignments consisting of a total of more than 600 questions, and group assignments to assess their understanding of this objective. Finally, 3 major exams are given in lecture, pre-lab and post-lab tests are given in lab, and a midterm is also given in lab.

Objective/SLO 2: Apply methods of reasoning used by scientists: i.e., the scientific method based on the requirements of FILCheRS rules (i.e., falsifiability/testability, logical consistency, comprehensiveness of evidence, intellectual honesty (objectivity), replication of results, and sufficiency of evidence).

How will the objective be addressed (including strategies and techniques)?
These methods of reasoning, which we group together under the acronym FILCheRS, form the backbone of the course. These criteria are introduced early in the course and every topic/claim covered in the course is evaluated using these criteria in order to help students improve their critical thinking skills and to help them understand both how scientists think (i.e., how science is done) and why science is a reliable way of knowing.

Describe how the objective will be assessed: The CAT exam specifically requires students to consider how a claim might be tested, whether the evidence provided is sufficient to warrant a stated conclusion, and what conclusions can be logically drawn given the information provided. It also requires students to propose alternative hypotheses and describe how they would test them. The FSE exam, the homework assignments, group assignments, and case studies and labs (which are based on case studies and group activities) specifically require students to use these criteria. [Results from the pre and post-CAT analyses show a highly statistically significant increase in critical thinking. Our results, as compared to over 120 universities using the CAT to assess critical thinking, are, according to Dr. Barry Stein, Director of the "CAT" program at TTU (i.e., the Center for Assessment & Improvement of Learning), "it is one of the courses that has produced the largest overall gains in CAT scores." The overall FSE exam results also show a highly statistically significant increase in scores as well.]
Objective/SLO 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.

How will the objective be addressed (including strategies and techniques)?
The use of the FILCHERS rules throughout the course, which are based on critical thinking, address this. Just as importantly, the students use two textbooks, one of which is titled, "How to Think about Weird Things", and was written by two philosophers who specialize in logic. The entire text is devoted specifically to using critical thinking skills, coupled with relevant scientific information, to evaluate both scientific and pseudoscientific claims. It teaches students common logical fallacies and sources of bias, and it repeatedly stresses, as does the lecture material, the need to think critically in order to make better decisions. Hypotheses and theories are specifically contrasted with the idea that these are merely opinions as, for example, when discussing the Big Bang theory and the Theory of Evolution - theories which many students commonly think of as mere 'opinions' - not as scientific theories founded on empirical evidence, the laws of nature, and logic. Objective information is contrasted with subjective experience and both are discussed in terms of their reliability as a means of gaining knowledge about the world.

Describe how the objective will be assessed: The CAT and locally-developed FSE exam both test students' tendency to avoid (or not) common logical fallacies and biases that might interfere with the drawing of a correct inference. The homework assignments have questions that directly address these ideas, as do the case studies. Logical fallacies and biases are referenced repeatedly and continuously throughout the course.

Objective/SLO 4: Learn key concepts and theories from a variety of scientific disciplines, especially physics, biology, and geology.

How will the objective be addressed (including strategies and techniques)?
The lecture material focuses directly on this as does one of the texts used, which is an integrated science textbook. Specifically, students are taught, among many topics, the evidence for the geocentric and heliocentric model of the solar system, the nature of stars and galaxies, the equivalence of matter and energy, the evidence for the Big Bang, basic concepts regarding Relativity Theory, the nature of matter, and the four fundamental forces of nature. Geologic topics dealing with rocks and minerals, sedimentary environments, relative and absolute dating, uniformitarianism, plate tectonics are covered, and, in biology, the principles of ecology, genetics, thermodynamics, and evolution are addressed. Students are required to use these concepts to evaluate claims. For example, students evaluate paranormal claims based on their understanding of the forces of nature and, in so doing, come to realize that these claims contradict our understanding of the way in which the universe works. They evaluate the claim regarding the Loch Ness monster by using principles of ecology and thermodynamics, primary productivity and food chains, minimum population breeding size required to maintain a population, the geographic distribution of ectotherms, and certain geologic concepts related to isostatic adjustment and continental glaciation. They evaluate UFO claims using information about stellar distances (the size of the galaxy), planetary evolution, the Theory of Relativity, energy requirements for space travel, biological and psychological considerations associated with prolonged isolation, and Newton's laws pertaining to acceleration/g-forces.

Describe how the objective will be assessed: This topic is assessed with the FSE exam, homework assignments, a group assignment, and lab activities. We also use an instrument called the MATE [Measure of the Acceptance of the Theory of Evolution] as an indicator of student's understanding and acceptance of evolution - and, by inference, of the reliability of
science as a way of knowing. * Using a pre-and post analysis, our results show a highly statistically significant increase in the acceptance of evolution. The results of comparisons with other science courses, including Environmental Science, showed no change in the test results.)
Objective/SLO 5: Demonstrate how to distinguish science from pseudoscience by scientifically evaluating a wide variety of extraordinary claims that are common in our culture today.

How will the objective be addressed (including strategies and techniques)?
This is addressed throughout the course, as many of the course activities require students to apply scientific information to an analysis of extraordinary claims, many of which are pseudoscientific in nature and can be regularly seen on TV, in the movies, and in advertisements. For example, one of the lab case studies concerns astrology, a long-standing pseudoscience. Students use their knowledge of astronomy and physics to evaluate the claims of this pseudoscience and, in so doing, apply their knowledge and critical thinking skills to evaluate a claim with which virtually all students are familiar. As another example, students evaluate health-related claims associated with non-FDA approved diet supplements using their knowledge of FIDCHers rules, experimental design, expectation bias, placebo effects, and the use of pseudoscientific terminology in advertisements.

Describe how the objective will be assessed: This is assessed using the FSE exam, the homework assignments, the group activities, case studies (such as the ones dealing with Xango juice, and another dealing with the alleged connection between the MMR vaccine and autism). In one of the labs, students choose a health product (non-FDA approved) and evaluate it using FIDCHers, critical thinking skills, and the knowledge they have gained in lecture regarding the experimental method.

PART IV – THECB Skill Objectives

Address each of the THECB skill objectives required within the component area. Explain how the skill is addressed, including specific strategies to address the skill(s). Address ALL skill objectives associated with the selected Component Area. (See Appendix)

1. Critical Thinking Skills: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information

How will the skill be addressed (including specific strategies, activities, and techniques)?
As discussed above, the improvement of critical thinking is one of the primary goals of this course. (The other is the enhancement of scientific literacy.) Objectives 1, 2, 3, and 5 above specifically address the improvement of critical thinking and, as discussed above, this is done using a combination of case studies in lecture and in lab, through specific questions in homework assignments, and in the three group homework activities which specifically require students to use critical thinking skills.

2. Communication Skills: to include effective development, interpretation and expression of ideas through written, oral and visual communication

How will the skill be addressed (including specific strategies, activities, and techniques)?
Students in the Foundations of Science class, in both lecture and lab, are placed into groups and are required to work together on case studies in lecture and on the two group homework assignments. In lab, students work together on all lab activities - including the group quizzes given in each lab. Some of these group quizzes require a written response, as do some of the
individual lab quizzes, though most are multiple choice questions. These quizzes were developed by the instructors of the course. (Each lab entails both an individual, pre-lab quiz and a group, post-lab quiz.) All of the group activities require the students to orally communicate with the other members of the group, and to the class as a whole during discussions. The quality of the oral interactions are reflected in the peer scores assigned by the members of the group to one another. One of the labs specifically requires the students to give a group presentation, using Power Point, and it is this report that is evaluated by the instructor and the other students in the lab. A rubric will be used by the instructor and students to evaluate the quality of the presentation. So, these activities require oral and visual communication and necessarily require the interpretation of ideas. In addition, the three lecture group homework assignments are written and these are evaluated by the instructor using a rubric that includes indicators of the quality of the writing. All students in a group are required to contribute to the group's paper for these two assignments.

3. **Empirical and Quantitative Skills**: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

How will the skill be addressed (including specific strategies, activities, and techniques)? The entire course requires that students use empirically-derived information to evaluate both scientific and pseudoscientific claims. (The concept of empiricism, as one of the 'foundations of science' is specifically discussed early in the course and used throughout the course.) In the case studies used in lecture and lab, students are given data and asked to interpret it. For example, in the lab dealing with perceptual biases, students are given graphical data regarding the alleged link between cell phone use and brain cancer and asked to interpret the correlation based on sample size and the scatter in the data points. In the lecture case study concerning the alleged association between the MMR vaccine and autism, students are given the actual data set obtained by the investigator that first suggested a possible link between the two. They are also presented with subsequent experimental results and asked to draw conclusions based on the information available. Several of the homework questions provide data in the form of tables or graphs and then ask students to interpret it. As regards quantitative data, students are asked to do such things as calculate the age of rocks based on radiometric dating information, calculate the buoyancy of continental crust vs. oceanic crust based on data obtained in lab experiments, calculate the distances to the stars, and calculate the force exerted by a star on a person. In one of the physics-related homework assignments, students calculate such things as kinetic energy, work, and free fall time.

4. **Teamwork**: to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

How will the skill be addressed (including specific strategies, activities, and techniques)? As discussed above, all students in the Foundations of science class, in both lecture and lab, are placed into groups and are required to work together on case studies in lecture and on the two group homework assignments. This necessarily requires the students to work as members of a team and to develop their ability to work effectively with one another. In lecture, guidelines are presented (and posted to Black Board) to help students understand the importance of respect when expressing ideas. They are also informed about some of the common things that can adversely affect a group's ability to work together, such as failure to allow everyone to express their opinion or assuming that the person who most strongly expresses an opinion is necessarily correct. (This, too, relates to a common bias.)
5. **Personal Responsibility**: to include the ability to connect choices, actions and consequences to ethical decision-making

How will the skill be addressed (including specific strategies, activities, and techniques)?
NA for science classes

6. **Social Responsibility**: to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities

How will the skill be addressed (including specific strategies, activities, and techniques)?
NA for science classes

**PART V – SHSU Core Curriculum Committee Requirements**

1. Using a 15-week class schedule, identify the topics to be covered during each week of the semester. Provide sufficient detail to allow readers to understand the scope and sequence of topics covered.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>&quot;Weird Things People Believe and Witch Trials of the Past and Present: Why Evidence and Reason Matter&quot; (This section attempts to show students that it does matter whether people understand how the world works and whether or not they think critically. This is emphasized by reviewing what happened to people who were erroneously accused of being witches because of a lack of understanding of the world and of the relevance of evidence. Students also do a lab concerning the Salem Witch hysteria and examine alternative natural explanations as to what might have happened.)</td>
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<td>Week 2</td>
<td>&quot;The Nature of Science - What's the difference between Scientific and non-Scientific &quot;Ways of Knowing&quot;?&quot; (TheFilCheRS rules are introduced, as are the the concepts of empiricism, skepticism, Occam's Razor, and critical thinking as four of the foundations of science.)</td>
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<td>Week 3</td>
<td>Continuation of the Nature of Science discussion.</td>
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<td>Week 4</td>
<td>&quot;Why Things Aren't Always What They Seem to Be&quot;. (This section concerns the limits to perception and memory; i.e., the ease with which we can make mistakes based on the misinterpretation of information and bad memory.</td>
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<td>Week 5</td>
<td>Continuation of the Limits to Perception and Memory lectures including actual instances in which people made mistakes with tragic consequences. This discussion reinforces the need for the scientific method as a means of helping to reduce the possibility of making mistakes by trying to account for errors in both reasoning and perception. It shows why science works; i.e., why it's reliable.</td>
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<td>Week 6</td>
<td>Begin Astronomy section: “What are those Lights in the Sky? Stars, Planets, Galaxies and the Size of the Universe”</td>
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<td>Week 7</td>
<td>Continue astronomy with focus on the evidence for the geocentric and heliocentric models of the solar system. (This section focuses on the importance of empiricism and highlights how humankind had been misled by their senses when developing the earlier geocentric model of the solar system. It also introduces a discussion of scientific laws in the context of Kepler's Laws of Planetary motion. Students begin learning the difference between a hypothesis, law, and theory.)</td>
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<td>Week 8</td>
<td>&quot;The Big Bang and the Nature of the Universe -- or Is it a Multiverse?&quot; (This discussion emphasizes the nature of a scientific theory and the importance of observable evidence and the ability to...</td>
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<td>Week</td>
<td>Topic</td>
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<td>9</td>
<td>&quot;Paranormal phenomena&quot; (This section requires students to critically evaluate claims regarding paranormal phenomena using their understanding of physics and the nature of forces and matter covered in the previous section. Scientific tests of paranormal phenomena, such as ESP, are also discussed with an emphasis on the problem of experimenter bias, flawed studies, and problems with the replication of studies.)</td>
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<td>10</td>
<td>&quot;Complimentary and Alternative Medicines&quot; (This section of the course deals with the experimental method as applied to this topic; e.g., independent and dependent variables, control groups, placebo effects, and double-blind studies - again with an emphasis on the need for these to reduce sources of error in our interpretation of results and experiences. It also discusses the FDA approval process and many factors that can cause us to incorrectly conclude that a 'treatment' has worked. Specific pseudoscientific and/or unfounded claims are evaluated, such as homeopathy, therapeutic touch, acupuncture, and the alleged benefits of megadoses of vitamins.)</td>
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<td>11</td>
<td>Continuation of CAM lecture material</td>
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<td>12</td>
<td>&quot;Atlantis and Geology&quot; (This section covers geologic information pertaining to rocks and minerals, plate tectonics, dating techniques, and uniformitarianism. The goal is to show that knowledge of geology (and by implication, science in general) can be used to evaluate an extraordinary claim while at the same time providing students with another example of a scientific theory and how the information upon which it is based was obtained. It also relates to the age of the earth as determined by science. This ties to the information regarding the age of the universe and will relate to evolution - which requires an immense amount of time to occur.)</td>
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<td>13</td>
<td>&quot;The Loch Ness Monster&quot; and &quot;Genetics&quot; (The section on Loch Ness requires students to apply concepts from ecology, biology, physics and the psychology of perception to evaluate this claim. The section on genetics lays the basis for the discussion of evolution in terms of understanding what DNA is, how it is copied, and how changes in the genetic code occur.)</td>
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<td>14</td>
<td>Complete genetics and begin &quot;Evolution&quot; (The section on evolution contrasts the Theory of Evolution with the idea of Intelligent Design using the F11ChERs criteria and the Criteria for Adequacy discussed in the course. In this section, the evidence of evolution is discussed (e.g., vestigial structures, comparative embryology, the fossil record) and it also explains the process of evolution via natural selection acting on genetic change.)</td>
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<td>15</td>
<td>Complete Evolution with an emphasis on the fact that strong theories in science are based on empirical data and critical thinking. It also stresses the significance of the consistency of information, from multiple branches of science, in the development and evaluation of scientific theories.</td>
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2. Attachments (Syllabus Required)

Syllabus Attached? ☑ Yes ☐ No
Other Attached? ☑ Yes ☐ No If yes, specify: Sample rubrics
Appendix: THECB Component Area Descriptions and Skill Requirements

I. Communication (Courses in this category focus on developing ideas and expressing them clearly, considering the effect of the message, fostering understanding, and building the skills needed to communicate persuasively. Courses involve the command of oral, aural, written, and visual literacy skills that enable people to exchange messages appropriate to the subject, occasion, and audience.)

II. Mathematics (Courses in this category focus on quantitative literacy in logic, patterns, and relationships. Courses involve the understanding of key mathematical concepts and the application of appropriate quantitative tools to everyday experience.)

III. Life and Physical Sciences (Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.)

IV. Language, Philosophy, and Culture (Courses in this category focus on how ideas, values, beliefs, and other aspects of culture express and affect human experience. Courses involve the exploration of ideas that foster aesthetic and intellectual creation in order to understand the human condition across cultures.)

V. Creative Arts (Courses in this category focus on the appreciation and analysis of creative artifacts and works of the human imagination. Courses involve the synthesis and interpretation of artistic expression and enable critical, creative, and innovative communication about works of art.)

VI. American History (Courses in this category focus on the consideration of past events and ideas relative to the United States, with the option of including Texas History for a portion of this component area. Courses involve the interaction among individuals, communities, states, the nation, and the world, considering how these interactions have contributed to the development of the United States and its global role.)

VII. Government/ Political Science (Courses in this category focus on consideration of the Constitution of the United States and the constitutions of the states, with special emphasis on that of Texas. Courses involve the analysis of governmental institutions, political behavior, civic engagement, and their political and philosophical foundations.)

VIII. Social and Behavioral Sciences (Courses in this category focus on the application of empirical and scientific methods that contribute to the understanding of what makes us human. Courses involve the exploration of behavior and interactions among individuals, groups, institutions, and events, examining their impact on the individual, society, and culture.)

<table>
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<tr>
<th>Required Skill Objectives</th>
<th>Critical Thinking</th>
<th>Communication</th>
<th>Empirical &amp; Quantitative</th>
<th>Team Work</th>
<th>Social Responsibility</th>
<th>Personal Responsibility</th>
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<tr>
<td><strong>Foundational Component Areas</strong></td>
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<td>Language, Philosophy &amp; Culture</td>
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<td>Creative Arts</td>
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<td>American History</td>
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<tr>
<td>Government/Political Science</td>
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<td>Social and Behavioral Sciences</td>
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Foundations of Science  
CID: 80027  
Fall Semester 2012

Course Number and Title: Geography 1436-02: Foundations of Science (4 credit hrs)

Class Time: Tuesday & Thursday 12:30-1:50

Class Meeting Room: Lee Drain Building 207

Name: Dr. Marcus Gillespie - Office Number: LDB 336 and LDB 200 (Dean's Office area)  
Office Hours: MWF 8:30-10:00 in LDB 200 and TTh 2:00-3:00 in LDB 336  
Phone: 294-1233 and 294-1945  
E-mail: Marcusg@shsu.edu

* I always try to have an “open-door” policy as regards office hours, so please feel free to call or come by any time that you have a question.

Catalog Description: The course focuses on the nature of science as a reliable method of acquiring knowledge about the natural world. Students will learn how to apply key scientific facts, concepts, laws and theories to distinguish science from non-science, bad science, and pseudoscience by analyzing a variety of claims and case studies. By employing an innovative, interdisciplinary approach to science education, this course is designed to increase science literacy and critical thinking skills for introductory-level students who are not science majors. Students MUST enroll concurrently in the corresponding lab for this course. Credit: 4

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. All lectures are available on Power Point and can be accessed through BlackBoard under the “Course Documents” section.
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.

Textbook Information: There are two textbooks for the course, one reader, and a lab manual. The first book listed is an integrated science text that provides the scientific knowledge for the course. The second text provides an understanding of how to use critical thinking and scientific reasoning to evaluate extraordinary/weird claims. The reader examines many of the ways in which errors in reasoning can lead people to reach erroneous conclusions – such as the belief that they were abducted by aliens. Although the focus of the book is on alleged alien abductions, the concepts discussed apply to the evaluation of claims in general.


If you have the non-custom edition of this textbook from the previous semester, it will be fine to use that text because the custom edition is simply a shortened version of the original; i.e., material that we do not use was removed in order to reduce the cost. Just be aware that the page numbers will differ – but the content of the assigned readings will be identical.


If you have the 5th edition of the book, you can use it. However, there were some very minor changes made in the 6th edition, and you would be responsible for any material that might have been added to the 6th edition.


Supplies: You will need approximately 11 of the "long" Scantron test forms (the 100-question version; 50 on front and 50 on back [form #882-EJ]) and 12-13 of the "short" Scantron test forms (15 question "Quizzstrip”; form #815-E); you will also need a calculator for lab.

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 44.49% of the grade, the lecture assignments constitute 31.36%, and the lab assignments constitute 24.15%. 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; it is NOT two separate courses - as is the case with most other introductory science courses at SHSU.

Grading will be based on three (3) lecture exams (including the final), group case study activity grades in lecture, three (3) homework assignments (each of which is a group/team assignment), 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. You will also be given a critical thinking assessment at the beginning and end of the semester that serves as extra credit. This extra credit can be very important to your overall grade, so PLEASE do your best on both exams!

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 and matching-type questions, and will be worth 700 points. (Don't panic! There won't be 350 two-point questions – just a standard number of questions©) Tests total 2,100 points and constitute 44.49% 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 reading quiz will normally be given every two weeks over the reading material. These quizzes will be completed outside of class on the Scantron 882-e form and turned in at the beginning of class on the due date. You are asked to use your books and notes to complete the quiz! The quizzes will be posted in Word format on BlackBoard (BB) in the Course Assignments section and will consist of questions from each of the assigned readings. The number of questions will vary based on the content of the readings, but all scores will be adjusted to an 80-point scale. The number of questions averages about 70 per quiz, and ranges from 14 to 115.

There are 8 sets of reading assignments (about one set every two weeks). I strongly recommend that you thoroughly read the material ahead of time and then, only where needed, reference the books while taking the quiz. 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 – as many students have found to the detriment of their test grades. However, reading all of the material for comprehension does work! Because the quizzes are not timed, you can read one chapter, do the questions on that chapter, then read the next chapter and take the questions over that one, and so on until the quiz is completed. This allows you to pace yourself over the two-week period.

Pacing is the key to not being overwhelmed!

Make sure to write the answers to the questions on the Word document because the Scantrons will not be returned.
Once the quizzes have been submitted, the answers will be posted on BB. The answer key will indicate the correct answer and, in many cases, explanations are provided for the answers. Please remember that this course is about understanding and reasoning – not memorization. So, you should always look over the readings when you miss a question in order to ensure that you understand the concept. The answer keys serve as a sort of study guide for the readings.

Again, each reading quiz is worth 80 points and there are a total of 640 points possible for these quizzes, plus 20 points for a take-home syllabus quiz you will also be given. Together, these are worth 13.98% 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 5 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 12.29% of the total course grade. Groups also will be formed in lab, and group work in lab constitutes 9.53% of the total course grade. So, in total, group scores comprise 21.82% 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

If you are in a group consisting of 5 members (including yourself), you will be allotted 40 points to distribute among the members of your group following each group assignment. You do not give points to yourself. (If you are in a group of 6 members, you will be given 50 points, etc…) If you believe that everyone contributed equally to the group work, then you would give everyone 10 points on the assignment. If everyone in the group feels the same way, then everyone receives a total of 40 points from their peers, which results in an average score of 10 points (40 points/4 = 10 points).

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 a zero. Of course, if someone worked harder than the rest, then give that person more than 10 points. (But, if you do this, then someone else will have to receive less than 10 points because there are a limited number of points to award).
It is critical 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! In order to be fair and accurate, DO NOT wait until the midterm or the end of the semester to assign these participation scores (for reasons that will be apparent when we discuss the limits of peoples' memories); rather, assign the scores immediately after the assignment is completed.

At the end of the semester, your peer evaluation score is equal to the average of the 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 9 points 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 points, you will receive 100% of the points earned by your group on the group assignments. If you receive more than 10 points, you will receive more than 100% - up to a maximum of 105% of the group points. For example, if your average was 10.2, then you would receive 102% of the group points. 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.

You must use the following additional criteria when assigning points:

1) Be fair! If a person made a genuine effort to contribute, then award 10 points. If they did above and beyond what was expected, then give more than 10 points – up to a maximum of 15. But, 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.

2) You cannot give anyone in your group more than 15 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 fewer points to distribute to other group members). Understand that, If you give someone more than 10 points, then you must necessarily give someone else less than 10 points because you can’t award more points than you have available to give (50 points in a 6-person group and 40 points in a 5-person group, etc.)

3) You do not have to assign all of your points. (This means that you should not give any remaining points to someone who you feel does not deserve them.) If someone is absent in your group on the day of the assignment, give them a zero.

Just as importantly, DO NOT award the absent person’s points to other members of the group.

This undermines the system and is not fair because it artificially inflates scores, and the amount of ‘inflation’ would vary depending upon group size and the number of people that were absent.

4) Anyone receiving an average of less than 7 points 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 less than a 7 in lecture, the student will lose all of the group-based points earned by the group in lecture. This amounts to a maximum 580
points out of 4720 possible in the course and constitutes 12.29% of the total course grade; i.e., just over one letter grade. In the same way, if a student receives less than a 7 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 450 points. This equals 9.53% of the total course grade. And, if a student received less than 7 in both lecture and lab, they would lose up to 21.82% of the total course points; i.e., more than 2 letter grades. The point is, "Do you best to contribute to the group?"

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. And, if one student gives a score that is much less than those of other students (which implies that it is unfair), I have the option of ignoring that score. In fact, I can override a low average score if there is evidence that the grade was unfairly assigned by the group. This serves as a safety net.

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 scores in lecture of 8, 11, 9, 10, and 8, for a total of 46, which is an average of 9.2, or 92%. John received 12, 11, 11, 13 and 14 for a total of 61, which is an average of 12.2, or 122%. Billy, who skipped class, didn’t sit with his group, and contributed very little to the group, received scores of 2, 5, 3, 5, and 2 for a total of 17 points and an average of 3.4, or 34%. So, Linda received 92% of the group’s overall grade for the semester. Because John’s average was higher than 10.5, John would receive 105% of the group’s points (the extra points are a reward for doing so well!). With an average of 34%, 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% - 12.5% = 58.5%). 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. Keep a copy of what you have written in case there is a conflict. 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.

An initial, trial peer evaluation will be done approximately halfway 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.

**Homework Assignments**

There will be three group homework assignments worth a total of 400 points (8.47% of course grade). Two of the group assignments are called Mini-media Critiques (MMC) and consist of writing a short (no more than one page) critique of a news story, TV show, or article which the members of your group select. The purpose of the critique is to apply the concepts you're learning in class to the 'real world' by identifying examples of the use of logical fallacies and/or failures to provide appropriate information that would otherwise result in a more honest and accurate story.

The third assignment is known as FiLCHeRS and is worth 220 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.

**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 240 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 60 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, if a student is habitually tardy, 60 points can be deducted for each tardy after the second tardy.
Each unexcused absence (after 2) and/or tardy (after 2) amounts to 1.27% of the course grade. 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 their 240 points, which equals 5.08% of his or her total 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 – 60 points (1.27% of grade)  
4 absences/tardies – 120 points (2.54%)  
5 absences/tardies – 180 points (3.81%)  
6 absences/tardies – 240 points (5.08%)  
> 6 absences/tardies = F

1. In addition to the required attendance/tardy policy, it is important that you stay for the entire class -- please do not leave the class room 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, 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. 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), let me know ahead of time and we can make arrangements for a make-up exam.

3. **Late Work Policy:** Your reading quizzes and the three group homework assignments can be handed in a maximum of **one class period after the due date**; however, 10% of the value of the exercise will be deducted for each day it is late – up through the beginning of the next class period. If, for example, the homework assignment is due on Tuesday at 11 AM, but is handed in on Tuesday at 1 PM, 10% will be deducted. If the paper is turned in on Wednesday, 20% of the value of the assignment will be subtracted. And if it is submitted at the beginning of the class on the Thursday immediately following the Tuesday due date/time, 30% will be deducted. It must be emphasized that, after that date, the assignment cannot be turned in and no grade will be received for the assignment.

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, or if it was not posted, 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.

In general, at the beginning of the lab, each student will be given a short, INDIVIDUAL quiz over the information provided in the lab readings. This is intended to ensure that everyone reads the lab before coming to class so that they will be prepared for the lab discussion. This quiz may include the vocabulary terms listed near the end of the assigned chapter in the lab manual – so be sure to study them!

Following the completion of the lab, each group will be given a GROUP quiz over the information covered in lab. The group will work together as a team to complete it. 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 peers using the procedure discussed previously. Accordingly, the total number of points the group earns over the course of the semester for work on labs is the maximum that any one member for the group can receive for the group quizzes – unless the student has an average of greater than 10 points on the peer evaluation, in which case he/she receives extra points up to a maximum of 105% of the group points (as discussed previously). The individual and group quiz scores are each worth 50 points; so, each lab is worth 100 points. A total of 10 lab case studies will be completed and students will be allowed to drop their lowest lab individual and lowest lab group grade. Thus, the lab quizzes, both individual and group, total 900 points, which is 19.06% of the course grade.

* The lab instructors will record your grade as a percent. To convert to a 50-point scale (so that you can keep accurate track of your grades), just multiply 50 by the percent you received (converted to a decimal). For example, if you received an 80% on the quiz, multiply 50 by 0.8 to obtain 40 – the number of points you earned on the quiz.

There will be a lab midterm exam that is worth 240 points. This is an individual exam score – not a group score. *The midterm may also be recorded in percent form; so, multiply 240 by the percent score you received to obtain the actual point value. For example, if you made 76% on the midterm, multiply 240 by 0.76 to obtain 182 points.
In summary, students earn individual lab points for the individual lab quizzes (450 points possible) and the mid-term exam (240 points). Students also earn group-derived scores based on group quiz scores, which will be adjusted based on the peer evaluation score received by group members (450 points possible). Thus, there is a total of 1140 lab points possible in lab.

In total, the lab portion of the course grade constitutes 24.15% of your grade – which is almost identical to the amount that would be earned relative to a standard lecture + lab class. In other words, if you took a science class in which the lecture and lab were separate, and earned 4 hours of credit for this combination, the lab would constitute 1 of 4 total hours, or 25% of the grade component for the science class. However, please remember that, in this course, the lecture and lab grades are combined to determine your overall course grade.

- As discussed above, your lab TA will record your grades as a percent rather than as a point value. If so, the lab instructor will average your percent scores on the individual and group scores and then multiply the average by 1140 points (after the group points have been adjusted by the peer evaluation score). This results in the same score as would be obtained if the scores were first converted to point values (as described above) and then summed. In math, there’s more than one way to get the same answer!

**Extra Credit**

At both the beginning and end of the semester, you will be given the opportunity to earn extra credit worth up to 9% of the total course grade! That’s 430 points! This opportunity to significantly improve your grade will be in the form of a critical thinking assessment – either the CAT assessment or the FSE assessment. This assessment, which will be given in lab, is required by the University’s reaccreditation requirements. It is extremely important that you do your best on both exams because your scores reflect upon the university and indicates how well our students are doing relative to students at other universities in the United States. It’s your chance to not only earn a lot of bonus points, but also to make SHSU look good! So, please do your best.

* Because this is required for university accreditation purposes, students must take this assessment. It’s not an option – but why would anyone want to pass up the chance to earn extra credit even if they could opt out of taking it?

The grading procedure for this assessment consists of simply adding the two scores together - unless you score above 144 points, in which case a multiplier is used to further increase the number of points you can earn. (It’s a bit like the multiplier used on some lotteries.) This means that the procedure for awarding bonus points is very generous.

For example, if you made a combined score of 110 points on the assessments, the 110 points will be added to your grade. And, if your total on both assessments is greater than 144 points, you will receive even more extra credit points! The amount you would receive for scoring above 144 points is equal to the number of points you earn above 144, multiplied by 2 – with a maximum of 190 extra points possible. (190 points is equal to 4% of the course grade). So, if you received the maximum number points on these exams, you would receive a grand total of 430 bonus points (9% of the course grade), which is almost an entire letter grade! This is why it’s important to do your best on both assessments.

For example, if you made a 70 the first time you took the assessment and a 95 the second time, you would have earned a total of 165 points. Because the combined score for the two assessments is 21 points more than 144 points, the multiplier is used and you would earn 42 more bonus points in addition to the 165 you’d already earned: 165 - 144 = 21; 21 x 2 = 42; 165 + 42 =
207 total bonus points). * Because these are bonus points, they would NOT be adjusted by a peer score. They're all yours!

Because you are being asked to take this critical thinking assessment at the beginning of the semester (the pre-test) before you have been taught the course material, we do not want you to be discouraged if you do not do as well as you might have expected on the pre-test. That is why we give additional bonus points if you achieve a combined score above 144 – which is a mere 60% of the possible points on the assessments! Because the score on the second assessment (the post-test) SHOULD improve if you learn from the course and you do your best on the assessment, you can easily make a good overall score and earn a significant number of bonus points.

You should know that a few students have actually earned the maximum number of bonus points possible!

*Please note that these assessments are the only possible sources of extra credit in the course. In other words, no individual extra credit is given and, with the exception of one lab grade, no grades are dropped.*

**Grade Determination**

Your grade is based on the percentage of points earned relative to the maximum number possible for the course (4,720). The percentage of the total possible points determined by individual effort is 78.16% (3,690 out of 4,720 possible), and that determined by group effort is 21.84% (1,030 out of 4,720 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.

All of the tests and assignments for the course, including lab assignments, are listed in the **Grade Form** on page 14. To keep track of your grades, you need to record each and every grade you receive on this form. (*Please note that Black Board will not calculate your grade; it's simply a place to store the grades for individual assignments.*) Using the form below, you can estimate your grade at any point in the semester by comparing the total number of points you have earned to-date to the total number of points possible at that point in the course. You can only estimate the grade because, prior to the end of the semester, your score on group work will not be adjusted based on your peer evaluations. **However, you should have a very good sense of how you are doing based on the original, unadjusted group scores coupled with your awareness of your participation in the group.**

**Abbreviations used in grade form**

<table>
<thead>
<tr>
<th>Lecture component</th>
<th>Lab Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS = Case Study</td>
<td>ILQ = Individual Lab Quiz</td>
</tr>
<tr>
<td>RQ = Reading Quiz</td>
<td>GLQ = Group Lab Quiz</td>
</tr>
<tr>
<td>SQ = Syllabus Quiz</td>
<td>MT = Midterm</td>
</tr>
<tr>
<td>HW = Homework</td>
<td></td>
</tr>
<tr>
<td>CT = Critical Thinking Test</td>
<td></td>
</tr>
<tr>
<td>MMC = Mini-media Critique</td>
<td></td>
</tr>
</tbody>
</table>
Grade Record Form

I. Lecture Grades (75.85% of total)
   Individual grades
   1. Test grades (44.49%)
      Test 1 ______ (700)
      Test 2 ______ (700)
      Test 3 ______ (700)
   A. Total test = ______

   2. Reading Quizzes (13.98%)
      SQ 1 ______ (20)
      RQ 1 ______ (80)
      RQ 2 ______ (80)
      RQ 3 ______ (80)
      RQ 4 ______ (80)
      RQ 5 ______ (80)
      RQ 6 ______ (80)
      RQ 7 ______ (80)
      RQ 8 ______ (80)
   B. Total Quiz = ______

   3. Group Grades in Lecture (12.29%)
      Moon CS ______ (60)  MMC 1 ______ (90)
      Xango CS ______ (60)  MMC 2 ______ (90)
      Autism CS ______ (60)
      FiLChE RS HW ______ (220)
   Total group lecture = ______

II. Lab Scores (24.15% of total)
   1. Individual Lab Scores (14.62%)
      ILQ 1 ______ (50)
      ILQ 2 ______ (50)
      ILQ 3 ______ (50)
      ILQ 4 ______ (50)
      ILQ 5 ______ (50)
      ILQ 6 ______ (50)
      ILQ 7 ______ (50)
      ILQ 8 ______ (50)
      ILQ 9 ______ (50)
      ILQ 10 ______ (50)
   Midterm ______ (240)

   F. Total Individual ______ (Drop lowest ILQ)

   2. Group lab Scores (9.53%)
      GLQ 1 ______ (50)
      GLQ 2 ______ (50)
      GLQ 3 ______ (50)
      GLQ 4 ______ (50)
      GLQ 5 ______ (50)
      GLQ 6 ______ (50)
      GLQ 7 ______ (50)
      GLQ 8 ______ (50)
      GLQ 9 ______ (50)
      GLQ 10 ______ (50)
   Total group quiz ______ (Drop lowest GLQ)

   C. Total group x peer score = ______

   G. Total group x peer score ______

4. Attendance (240 pts) (5.08%)
   -60 for each unexcused absence or tardy - after the second absence or tardy
   D. Total Attendance ______ (240 max. if no absences)

5. Extra Credit: Critical Thinking Assessment Scores (worth up to 9%)
   CT pre-test ______ (120 max)
   CT post-test ______ (120 max)
   Bonus CT ______
   E. Total CT points ______

To obtain your final grade (percent), add the totals labeled A, B, C, D, E, F and G, divide by 4720, and multiply by 100.

\[ \frac{\text{Total} \times 100}{4720} = \______ \]
Point range for final course grade

\[
\begin{align*}
A &= 4248-4720 \\
B &= 3776-4247 \\
C &= 3304-3775 \\
D &= 2832-3303 \\
F &= \text{less than 2832}
\end{align*}
\]

**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:

1) 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 direct order 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 laptop computers, cell phones, I-Pads, or any other type of electronic device, with the exception of a recording device, in class at any time 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., relative in hospital; spouse overseas in the military), then please tell me before class begins and put the phone in the vibrate mode.

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 DURING 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. Although significant amount of the information covered in class is presented in abbreviated form on the Power Point lectures, you will almost certainly need to write additional notes in order to recall, integrate, and understand the information. In addition, note 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.
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: Any student seeking accommodations should go to the Counseling Center and Services for Students with Disabilities at the very beginning of the semester and complete a form that will grant permission to receive special accommodations. Please do not wait until test day to do this—the request for accommodations must be done at the beginning of the semester and students that have permission to use the services at the Counseling Center must make appointments several days ahead of scheduled tests. Walk-ins aren't permitted. Also, please be sure to send me an e-mail two days before an exam to remind me to take the test to the Counseling Center.

Religious Holy Days: If a student desires to be excused from class, assignment, or a test on a religious holiday, 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 discus 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 course 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.

Reading assignments are in green font and include all material covered since the preceding quiz.
Case studies are in blue font.
Tests are in orange font.
Reading Quizzes are in red font.
Homework assignments are in purple 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!

- FOS = Foundations of Science (custom edition of the Conceptual Integrated Science textbook by Hewitt et al.
- Schick = How to Think about Weird Things by Schick and Vaughn
<table>
<thead>
<tr>
<th>Lectures</th>
<th>Labs</th>
</tr>
</thead>
</table>
| 1st 8/30 Introduction to course: *Weird Things People Believe* and “Witch Trials of the Past and Present: Why Evidence and Reason Matter”
Read Schick – Chapter 1 all: “Close Encounters With the Strange” pp. 1-13
Begin Reading “Abducted: How People Come to Believe They Were Kidnapped by Aliens” - *Finish reading this book by 10/2* | No lab |
| 2nd 9/4 Complete Witch Trials and begin Nature of Science
Read FOS - Chapter 1 all: “About Science” pp. 1-14
Read Schick Chapter 6: “Science and Its Pretenders” part 158-181 (nature of science & scientific reasoning) | No lab |
| 9/6 Continue Nature of Science lecture
*Collect student information for creating groups*
Read Schick – Chapter 3: “Arguments Good, Bad and Weird” parts 34-36 and 49-55. (*Pay particular attention to pages 49-55 dealing with informal fallacies. You will reference these throughout the course*) | |
| 3rd 9/11 Reading Quiz 1 due
Syllabus Quiz due
*NASA Activity; Form Groups* | labs start! CAT/FSE exam |
| 9/13 Continue Nature of Science lecture
Read Schick Chapter 4: “Knowledge, Belief and Evidence” parts 62-84 and summary on page 90 (opinion vs. knowledge and expertise)
*MMC Homework 1 assigned: due 10/4* | |
| 4th 9/18 Reading Quiz 2 due
Nature of Science lecture
“Why Things Aren’t Always What They Seem to Be”
Read Schick Chapter 5: “Looking for Truth in Personal Experience” part 96-142 (perception and memory problems) | Checks Lab |
| 9/20 Begin lecture on the Limits to Perception and Memory | |
| 5th 9/25 Xango Case Study | Salem Lab |
| 9/27 Continue Limits to Perception and Memory | |
Read FOS Chapter 2 all: “The Universe” pp. 15-34

6th 10/2 Reading Quiz 3 due
   *This quiz includes the Abducted book
Continue Limits to Perception and Memory
Read FOS Chapter 3: “The Atom” 35-56
Read FOS Chapter 4 “Energy and Momentum” 57-76

10/4 Complete LPM and Begin Astronomy 1 Lecture: “What are those Lights in the Sky? Stars, Planets, Galaxies” and “The Size of the Universe”
MMC 1 due
Read Schick Chapter 4: "Knowledge, Belief and Evidence” part 84-90 (astrology section)

7th 10/9 Continue Astronomy 1 lecture
Read Schick Chapter 7: "Case Studies in the Extraordinary” part 234-247 (UFO abductions)

10/11 Test 1 (NOS & LPM)
Read FOS Chapter 5 “Heat” 77-98

8th 10/16 Reading Quiz 4 due
Begin Astronomy 2 Lecture: “The Big Bang and the Nature of the Universe – or is it a Multiverse?”
Read the Laws and Relativity lecture posted on BB.
   This information is critical to doing the Star Trek lab next week – especially the section on relativity.
Read FOS Chapter 6: "Describing Motion" 99-116

10/18 Complete Astronomy 2 lecture
“Ghost Busting with Newton’s Laws”
Read FOS Chapter 7: "Newton’s Laws of Motion" 117-138

9th 10/23 Begin Paranormal Phenomena – Part 2 lecture
MMC 2 assigned; due 11/13
10/25 | Continue Paranormal Phenomena – Part 2 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 197-211 (parapsychology)  
| Read Schick Chapter 7: “Case Studies in the Extraordinary” parts 220-227 and 247-275 (talking to the dead, near-death experiences, and ghosts)

| 10/30 | Reading Quiz 5 due  
| Begins CAM 1 lecture on “Complimentary, Alternative, and Quack Medicines and Diets: take two ginkgo tablets and some homeopathic elixir and you’ll be fine!”  
| Read Schick Chapter 7 (homeopathy) part 227-231

| 11/1 | Test 2 (Astronomy, Laws, and Paranormal)  
| Read Schick Chapter 5 “Looking for Truth in Personal Experience” part 142-150 (anecdotal evidence, placebo effects and controlled studies)

| 11/6 | Reading Quiz 6 due  
| Continue CAM 1 lecture  
| Read FOS Chapter 8: “Human Biology – Care and Maintenance” 139-160

| 11/8 | Begin CAM 2 lecture  
| Read FOS Chapter 9: “Rocks and Minerals parts 161-184

| 11/13 | Continue CAM 2 lecture  
| Read FOS Chapter 10: “Plate Tectonics” pp. 185-210  
| MMC 2 due

| 11/15 | Vaccine-Autism Case Study  
| Read FOS Chapter 11 all: “The Solar System” pp. 211-232

| 11/20 | Reading Quiz 7 due  
| Atlantis and Crystal Power; What Rocks and Minerals Can and Can’t Tell Us”  
| Begin lecture on The Origin of Planet Earth (Geology)  
| F1LCHeRS assigned; due 12/4

| 11/22 | Thanksgiving
15th 11/27 Finish Geology lecture and begin Cryptids lecture - Legendary Creatures and a Discouraging Lack of Evidence: Nessie, Big Foot, and the Chupacabra!
Read FOS Chapter 12: "The Basic Unit of Life - the Cell" pp. 233-260

11/29 Finish Cryptid lecture
Read FOS Chapter 13 all: "Genetics" - pp. 261-286
Read Schick Chapter 8 all: "Relativism, Truth and Reality"
-- pp. 295-316

16th 12/4 Begin lecture on genetics - "Can Vulcans and Humans Make Babies? The Genetic Code of Life"
Read FOS Chapter 14 all: "Evolution" -- pp. 287-316
Read Schick Chapter 6: "Science and Its Pretenders"
part 187-197 (creationism)
Reading Quiz 8 due
Homework 2 FiLCHeRS due

12/6 “There is Grandeur in this View: Evolutionary Theory as the Foundation of Biology: Scientific Synthesis and Consistency”

Final – Covers material on Alternative Medicines and Diets, Geology, Genetics and Evolution and RQ 6 (dealing with Schick Chapter 5), RQ 7, and RQ 8, as well as the related lab material. It is not a comprehensive final exam, but you do need to know the logical fallacies and critical thinking tools used throughout the course.

Final Exam Time: Tuesday, 12/11 from 11:00 AM - 1:00 PM in LDB 207.

- A summary list of all of the READING QUIZZES, their due dates, and the chapters they cover is provided on the next 2 pages.

- A summary list of the MMC and FiLCHeRS assignments is provided on the last page of this document.
Reading Quizzes for Fall Semester 2012

*All quizzes are due on specified Tuesdays at the beginning of the period. Points will be deducted if they are submitted at that time.

- Schick = *How to Think about Weird Things* by Schick and Vaughn
- FOS = *Foundations of Science* text. *In addition to the new, custom *Foundations of Science* (FOS) page numbers, the earlier *Conceptual Integrated Science* (CIS) page numbers are also listed after the FOS page numbers in case you have the earlier edition. They are shown in green, italicized font.
- PowerPoint lectures on BB are in purple

**Quiz 1: Tuesday 9/11**

1) Schick – Chapter 1 all: “Close Encounters with the Strange” pp. 1-13
2) Begin Reading “Abducted: How People Come to Believe They Were Kidnapped by Aliens”
3) Read FOS - Chapter 1: “About Science” pp. 1-14
   *(CIS – Chapter 1 all: “About Science” pp. 1-12)*
4) Read Schick Chapter 6: “Science and Its Pretenders” part 158-181 (nature of science and scientific reasoning)
5) Read Schick – Chapter 3: “Arguments Good, Bad and Weird” parts 34-36 and 49-55. (Pay particular attention to pages 49-55 dealing with informal fallacies)

**Quiz 2: Tuesday 9/18**

1) Read Schick Chapter 4: “Knowledge, Belief and Evidence” parts 62-84 and summary on 90 (opinion vs. knowledge and expertise)

**Quiz 3: Tuesday 10/2**

1) Read Schick Chapter 5: “Looking for Truth in Personal Experience” part 96-142 (perception and memory problems)
2) Read FOS Chapter 2: “The Universe” pp. 15-34
   *(CIS Chapter 28: all “The Universe” pp. 649-666)*
3) Includes the Abducted book

**Quiz 4: Tuesday 10/16**

1) Read FOS Chapter 3: “The Atom” pp. 35-56
   *(CIS Chapter 9: “The Atom” part 167-179)*
2) Read FOS Chapter 4: “Energy and Momentum” pp. 57-76
   *(CIS Chapter 4 on Energy part 63-74)*
3) Read Schick Chapter 4 Knowledge, Belief and Evidence” part 84-90 (astrology section)
4) Read Schick Chapter 7: Case Studies in the Extraordinary" part 234-247 (UFO abductions)
5) Read FOS Chapter 5: "Heat" pp. 77-98
   (CIS Chapter 6 "Heat" part 98-104)

Quiz 5: Tuesday 10/30

1) Read the Laws and Relativity lecture posted on BB. This information is critical to doing the Star Trek lab next week – especially the section on Relativity.
2) Read FOS Chapter 6 “Describing Motion” pp. 99-116
   (CIS Chapter 2 all: "Describing Motion" pp. 17-30)
3) Read FOS Chapter 7: "Newton’s Laws of Motion" pp. 117-138
   (CIS Chapter 3: "Newton’s Laws of Motion" part 36-49)
5) Read Schick Chapter 2 all: “The Possibility of the Impossible” pp. 14-29 (the possibility of ESP and precognition)
6) Read Schick Chapter 6: “Science and Its Pretenders” part 197-211 (parapsychology)
7) Read Schick Chapter 7: “Case Studies in the Extraordinary” parts 220-227 and 247-275 (talking to the dead, near-death experiences, and ghosts)

Quiz 6: Tuesday 11/6

1) Read Schick Chapter 7 (homeopathy) part 227-231
2) Read Schick Chapter 5 “Looking for Truth in Personal Experience” part 142-150 (anecdotal evidence, placebo effects and controlled studies)

Quiz 7: Tuesday 11/20

1) Read FOS Chapter 8: Human Biology – Care and Maintenance" pp. 139-160
   (CIS Chapter 20: "Human Biology II – Care and Maintenance" part 461-463 and page 70 on the "Placebo Effect"
2) Read FOS Chapter 9: “Rocks and Minerals” pp. 161-184
   (CIS Chapter 23: "Rocks and Minerals" parts 531-537 and 541-552
3) Read FOS Chapter 10: “Plate Tectonics” pp. 185-210
   (CIS Chapter 22 all: "Plate Tectonics" pp. 505-526
   (CIS Chapter 27 all: "The Solar System" pp. 320-338)

Quiz 8: Tuesday 12/4

1) Read FOS Chapter 12: "The Basic Unit of Life – the Cell" – pp. 233-260
   (CIS Chapter 15: "The basic Unit of Life – the Cell" - parts 319-328 and 334-336 (cell reproduction)

Continued on next page...
2) Read FOS Chapter 13 all: "Genetics" – pp. 261-286
   (CIS Chapter 16 all: "Genetics" – pp. 348-368)
3) Read Schick Chapter 8 all: "Relativism, Truth and Reality" pp. 295-316
4) Read FOS Chapter 14 all: "Evolution" pp. 287-316
   (CIS Chapter 17 all: "Evolution" pp. 372-396)
5) Read Schick Chapter 6: “Science and Its Pretenders” part 181-197 (creationism)
Mini-Media Critiques and FiLCHeRS Assignment

* These are group assignments and descriptions of them will be provided at the time they are assigned.

The MMC assignments are short, but require both individual and group effort. So, time must be allotted to coordinate work with the group members.

The FiLCHeRS assignment consists of both short answer and multiple choice questions. Some questions will require that you look up information on the Internet. For these questions, you will be asked to cite the web addresses of the sites you consulted to obtain the information.

1. **MMC 1** – assigned 9/13
   - due 10/4

2. **MMC 2** – assigned 10/23
   - due 11/13

4. **FiLCHeRS** – assigned 11/20
   - due 12/4
Rules for Assigning Points for Each Assignment/Activity

1. You have the equivalent of 10 points per person (not including yourself) to distribute among the members of your group. If, for example, there are 5 people in your group (including you), you have 40 points to allocate. If there are 4 members in your group, you have 30 points, etc... You do not give points to yourself.

2. The total number of points awarded to all group members cannot exceed the amount allotted - per rule number 1.

3. You cannot give anyone in your group more than 15 points for an assignment or activity.

4. You cannot give everyone in your group more than 10 points on a given assignment because this would amount to more than the allotted points. For example, if you were allocating 40 points in a group of five people, and decided you wanted to give everyone 11 points because you thought they did a great job, the total would be 44 points - which is more than the 40 points you have to allot: 4 x 11 points/person = 44 points. As another example, if you have 40 points to allocate, you can’t give one person 13 points and everyone else in the group 10 points because this sums to 43 points. In short, if you give someone more than 10 points, you must give someone else less than 10. It is essential that you not award more than the allotted points because it undermines the entire peer evaluation system. This really is a big deal!

5. If a person was absent the day of the assignment, you must give him/her a zero. Also note that if someone missed an assignment, it is impossible for that person to receive an average of 10 or higher - unless he or she received significantly more than 10 points from you on other assignments. But, again, if you gave him or her more than 10 points, you must give someone else less that 10. (I will deal with the issue of excused vs. unexcused absences, as well as make-up work.)

Also, if someone was absent in your group, do not give the “extra points” to the other members of the group. This would artificially raise their evaluations in an unfair manner. Also, not all groups are the same size; so, this practice would give the members of small groups an advantage over members in larger groups because the number of points available as “extra points” to give each person would not be the same. It would also vary with the number of people that were absent. Again, the only time you should give someone more than 10 points is if he or she did an exceptional job and you would have given him or her more than 10 points no matter how many people were present the day of the group activity. Again, if someone gets more than 10 points, then someone else must receive less than 10 points.

If YOU were absent the day of an assignment, you cannot assign points for the day you were absent. So, for example, if you missed one assignment out of 5, you would enter the 4 scores for the assignments for which you were present and divide the total by 4.

6. You do not have to assign all of your points. This means that you may have some points left over, and that is okay. In fact, this is very likely to occur if someone was absent the day of the assignment.
7. If you assign either more than 10 points or less than 10 points for an assignment, you MUST write a comment explaining why. This is especially important when assigning less than 10 points because the comments serve as feedback (anonymous) to help the student that received an average of less than 10 to correct their behavior.

Bear in mind that students who receive a group average of less than 7 will lose their group points.

The following amount of points will be deducted for not following the above rules.

1. 40 points for not submitting the form. Note: If you are unable to attend class the day it is due, you can submit it by e-mail because the e-version is available on BB.

2. 40 points if you give someone points on a day that person was absent because this shows you weren’t properly keeping track of the scores – and that means you weren’t being fair. So, please be fair and keep those points!

3. 20 points for incorrectly calculating the average score.

4. 20 points for recording scores, but not determining the average.

5. 20 points for not writing comments when awarding either more or less than 10 points.

These rules may seem harsh, but they are absolutely necessary to ensure that each student is fairly evaluated. Imagine, for example, a situation in which only two people in your group of 5 turned in an evaluation for you – and one score was okay (9), but the other was very low (3). Your average would be a 6, and this would cost you all of your group points! Not fair, you would cry! And, you would be right. It isn’t fair, but without the other member’s evaluations, I would have no way of knowing which score – the 9 or the 3, best reflected your work. This has, unfortunately, happened in the past and it adversely affected a student’s grade. That’s the reason for these rules. So, if everyone follows these simple rules, the system works!
Please type both the first and last names of your teammates in the spaces below. Immediately after each assignment is completed, record the scores you believe each person earned – but please do this at home, in private - not in the presence of your group members. Again, please do not wait until it is time to submit this form to complete it because you won’t be able to recall the details of the contributions of each member of your group. Keep the e-version of the form (with all grades shown) so that you will have a copy of the scores after the preliminary evaluation is printed and submitted at midterm.

See the back of this form for the rules to use when assigning points. It is essential that you read and follow the rules to ensure that the evaluation system is fair. If you do not follow the rules, you will hurt the members of your group, and you will also lose points - as described on the next page. To obtain the average, add the points you awarded to an individual for each of his/her assignments and then divide the total by the number of assignments to date. Accordingly, for the midterm evaluation, you will divide the total points earned to date by the number of assignments completed (3). For the final evaluation, you will divide the total by 7. See the Barney Fife example below:

You will submit this form twice, once midway through the semester and again at the end. So, please make sure to save the e-version with all of the grades on it when you submit the midterm evaluation. That way, you will still have all of the grades when it is time to submit the final evaluation.

<table>
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<th>Peer Name</th>
<th>NASA</th>
<th>Xango</th>
<th>MMC</th>
<th>Mid Total</th>
<th>Mid Avg</th>
<th>MMC HW2</th>
<th>Vacc. CS3</th>
<th>FiLCHeRS HW</th>
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<td>10</td>
<td>7</td>
<td>49</td>
<td>8.17</td>
</tr>
</tbody>
</table>

Please indicate why you gave someone less than 10 points: ______________________________________________________

Please indicate why you gave someone more than 10 points: ______________________________________________________
Rubric for in-Class Group Presentation for the CAM Lab

Please rank the quality of the presentation using the following criteria. For each criterion, use the numerical scale below and write your response in the blank provided to the left of the question. If the criterion did not apply to the claim (i.e., it wasn’t relevant to the claim) then indicate ‘NA’.

NA – not applicable to the claim
0 – not evident/not demonstrated
1 - evident/demonstrated, but of poor or insufficient quality
2 - evident/demonstrated and of reasonable/average quality (satisfactory)
3 - evident/demonstrated, and of high quality

Criteria:

____ 1. Did the group indicate whether or not the Rule of Falsifiability had been violated by the claimant?

____ 2. Did the group identify a logical fallacy in the claim? (*Some claims are not based on logical arguments – just statements. If there is no argument, indicate NA)

____ 3. During the presentation, did the group propose alternative explanations for the conclusions stated in the original claim (e.g. placebo effect, spontaneous remission, deceit…)? In other words, did the group adhere to the Rule of Comprehensiveness?

____ 4. Did the group adhere to the Rule of Honesty? Did the members evaluate the claim from an unbiased perspective?

____ 5. Did the group indicate whether or not the claimant provided sufficient evidence to support his or her claim? Did the group adhere to the Rule of Sufficiency?

____ 6. How well was the presentation organized?

____ 7. How well was the information presented? Was it stated in an understandable manner?

____ 8. Did the members of the group speak at an appropriate volume such that the members of the class could hear them?

____ 9. Were the Power Point slides of appropriate visual quality to indicate the point that was being made on each slide?

____ 10. Did each member of the group speak/contribute during the presentation?

____ 11. Were the group’s arguments regarding the validity of the claim persuasive?
Rubric for MMC1 (90 points possible)
Class _______ Group _______

- The original article MUST be attached to the essay in order to receive credit for this assignment.

____ Stapled (1)
____ Double spaced (2)
____ Title (2)
____ List of group members (2)
____ Appropriateness of Title (informative: not informative, vague, informative) (6)
____ Intro paragraph entailing general discussion of informal fallacies and their harm (organization, clarity) (8)
____ Author (2)
____ Source (detailed) (2)
____ Specific fallacy – must be identified correctly (15)
____ Discussion of fallacy (quality of discussion in terms of relevance, organization, clarity) (25)
____ Quality of discussion of how interpretation would have to change if fallacy weren’t included in the original article (relevance, organization, clarity) (25)
____ Grammar (-1 per error)
____ Spelling (-1 per error)
____ Individual fallacy identification (-15 if incorrect)

Total points ______
Rubric for Evaluating Teamwork

When evaluating anything, including teamwork, it is essential to have in mind the criteria by which it will be evaluated. Using the criteria helps to maintain objectivity and fairness – as well as consistency among those doing the evaluations. The following is a list – not necessarily complete – of things to consider when evaluating the contributions made by your group members. Please consider these when assigning a score to your group members on each of the assignments. As always, it's important that you complete the evaluation shortly after the group work is done so that you will be less likely to have forgotten things relevant to the evaluation. Please note that the group member's personal looks and appearance is not relevant to the evaluation of his or her contribution; nor is your personal like or dislike of the person, or your tendency to agree or disagree with them. All that matters is whether or not the person contributed constructively to the group work!

If it helps to arrive at a score, you can assign points on a 1-10 scale for each of the relevant items below and then average them.

Consider these things

1. Did the team member come prepared? Had he or she read the background material? (*Remember, if the person did not come on the day of a case study, he or she automatically receives a zero for the group score.)

2. Did the team member engage in the discussion and offer suggestions for consideration?

3. Was it evident that the team member had read the textbooks and had knowledge of the topic under discussion?

4. Was the team member polite and courteous, or rude and disrespectful?

5. Did the team member pay attention and stay focused, or did he or she disengage, act bored, etc.?

As regards assignments that required meeting outside of class time:

6. Did the team member come to meetings on time?

7. Did the team member notify the group if he or she was unable to come and provide a reasonable excuse for not attending?

8. Did the team member submit his or her portion of the work on time?

9. Was work submitted by the team member useful/appropriate?

10. Did the individual participate in proof-reading and evaluating the written assignment that was submitted for the group score?