Course Description: The philosophy of science is the examination of questions and issues that arise from the methods and results of modern science, but which are not themselves typically answerable by scientific methods. Examples of such questions and issues include: What, if anything, distinguishes genuine science from “pseudo-science”? What is the logic of scientific explanation? What are scientific laws? Is everything ultimately explainable using the theories and methods of science? What is the relationship between scientific theory and observation? When should we accept a scientific theory?

The above questions, and many others similar to them, are probably not answerable by doing physics, chemistry, sociology, or other types of empirical science. Yet the answers to such questions greatly influence how we interpret empirical science. Hence we have the philosophy of science, and the subject of this course.

Course Goals:
1. Development of improved critical reading, reasoning, and writing skills.
2. Development of an increased knowledge and appreciation of the philosophical and conceptual issues in the natural sciences.
3. Exposure to stimulating and provocative issues in a major area of philosophy.

Course Policies and Procedures:
Attendance: Attendance in lectures is expected. Since testable material is regularly introduced in lectures, it is impossible to miss class frequently and still do well in the course.

Late Papers: Assignments must be submitted at the beginning of the class period in which they are due for full credit. Late papers must be turned in by the start of the next class meeting; after that they will not be accepted. All accepted late papers are penalized a flat 10%. Reading Summaries have a different late policy (see below).

Make-up Work: I am willing to re-schedule assignments for individuals who have a legitimate reason for doing so. If you know you are going to miss an exam date, you must notify me at least two days in advance in order to receive a make-up. Unless you have made a prior arrangement with me, missed exams may be made up only in case of a documented emergency.

Disabilities Policy: If you have a specific disability that qualifies you for academic accommodations, please notify me and provide certification from Disability Services (Office of Special Students Services). The Office of Special Students Services is directed by Ms. Bernita Pulmas and is located in the Student Center, Room 270, Phone 460-7212.

Academic Dishonesty Policy: Academic dishonesty includes cheating on tests and homework as well as plagiarism. If you engage in academic dishonesty, I will notify you that you will receive an ‘F’ in the course. Upon being notified, you have five days to submit a written request to the department chairperson for a hearing on the matter, if you wish to have one. If no hearing request
is made, or if the decision from the hearing goes against you, you will receive a course grade of ‘F’. Please see the Student Academic Conduct Policy of the University for details.

Procedures for Assessment of Student Performance: Given that you adhere to the course policies, your grade will be determined on the basis of graded assignments as specified below:

Evaluation:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 Weekly Reading Summaries:</td>
<td>4% (x11) 44%</td>
</tr>
<tr>
<td>Written Essay:</td>
<td>18%    18%</td>
</tr>
<tr>
<td>Mid-Term Exam</td>
<td>18%    18%</td>
</tr>
<tr>
<td>Final Examination:</td>
<td>20%    20%</td>
</tr>
</tbody>
</table>

Assignments, practice exams, and other materials for our class are posted on my webpage at: [http://www.southalabama.edu/philosophy/loomis/index.htm](http://www.southalabama.edu/philosophy/loomis/index.htm)

**Weekly Reading Summaries**

The Weekly Reading summaries are due at the start of class on the dates listed on the syllabus (as “RS”). Do a reading summary only for the article with “RS” next to it. For example, in week 2 you will do a reading summary only for the Thomas S. Kuhn article, and turn it in at the start of class on Wednesday, 9/1. You must do at least 11 of the 13 summaries; I will drop the lower grades if you do more than 11. The summaries must be typewritten. They will consist of two parts:

i. A summary of the article that includes:
   1. A statement of the author’s thesis, that is, what he or she is arguing for or against. Sometimes this might include more than one claim.
   2. A definition of any special technical terms that are necessary for understanding the paper.
   3. A sketch of the course of the argument. By “sketch” I mean something like an outline highlighting the main issues and objections, although please use normal paragraph style writing, not outline formatting. Be concise here – details are not normally necessary, but use complete sentences throughout your summary.

ii. A question that you have about the article. This can either be a clarification question (e.g., “I don’t understand what P means by saying X”) or a philosophical question (e.g., “Given that P says X, how is he going to avoid the problem of Y?”).

**Length:** 1-2 pages, single-spaced, or 2-4 pages double-spaced. These must be typed.

**Why are we doing these summaries?**

- Encouragement to complete the reading.
- Practice at expressing complicated material.
- Improved comprehension through summarizing and questioning the article.

**Grading:** Reading summaries are graded from 0-4. My main concern in grading weekly reading summaries is to see if you’ve done the reading and tried to comprehend it.
understand that the material is difficult, and my grading of summaries takes this into account. Late assignments will lose 1 point (of 4) per class meeting, starting after the meeting they are due.

**Essay**
The essay assignment will be *typewritten, double-spaced*, and 6-10 pages in length. You will choose from a collection of questions that I will hand out. I have attached a short essay guide to help you with this assignment.

**Exams**
The exams will be a combination of objective and essay questions. The final will be comprehensive. You will get a study guide in advance.


**Syllabus:** This syllabus is subject to change; we may add or delete readings according to interest and time. Any changes will be announced in advance in class.

I have made an effort to keep the readings reasonably short and concise; most can be completed in less than one hour. Please read the listed selections *before* the date indicated. Students who don’t do the readings slow down the course, reduce the quality of discussion, limit their comprehension of the material, and, most importantly, deprive themselves of an opportunity to improve their critical reading and interpretive skills. So help the class *and yourself* by taking the time to do the assigned readings.

**Week** **Topic and Readings**

1. **The Demarcation Problem**
   - Karl R. Popper: “Science: Conjectures and Refutations”

2. - Popper, cont. *(RS due Monday 8/30)*
   - Thomas S. Kuhn: “Logic of Discovery or Psychology of Research?”

3. - Imre Lakatos: “Falsification and the Methodology of Scientific Research Programs”
   - Larry Laudan: “Science at the Bar – Causes for Concern” *(RS, due Fri., 9/10)*

   **No class Sept. 6**

4. - Laudan, cont.
   - Michael Ruse: “Pro Judice” *(RS, due Wed., 9/15)*

5. **Naturalism and Religious Belief**
   “Science and Myth”
   - Richard Dawkins: “Is Science a Religion?” *(RS, due Wed. 9/22)*
6. - Alvin Plantinga: “When Faith and Reason Clash: Evolution and the Bible” *(RS due Mon. 9/27)*  
Ernan McMullin: “Evolution and Special Creation”

7. *The Nature of Scientific Inference*  
- David Hume: “The Problem of Induction”  
- Carl Hempel: “The Role of Induction in Scientific Inquiry” *(RS, due Wed. 10/6)*

8. - Karl Popper: “The Method of Conjecture and Refutation” *(RS, due Mon. 10/10)*  
- Pierre Duhem: “Physical Theory and Experiment”

9. - Peter Lipton: “Contrastive Inference” *(RS due Wed. 10/20)*  
*Mid-Term Exam Friday, Oct. 22*

10. *The Nature of Scientific Laws*  
- Carl Hempel: “Laws and their Role in Scientific Explanations” *(RS due Mon, 10/24)*  
- Philip Kitcher: “Explanatory Unification”

11. - Merilee Salmon: “Explanation in the Social Sciences” *(RS due Wed. 11/3)*

12. *Theory and Observation*  
- N. R. Hanson: “Observation” *(RS due Mon, 11/8)*  
- Thomas Kuhn: “The Structure of Scientific Revolutions” (excerpt)

13. - Kuhn, cont.  
- Larry Laudan: “A Problem-Solving Approach to Scientific Progress” *(RS due Wed, 11/17)*

14. Laudan, cont.  
*Thanksgiving Break 11/24-8*

15. *Sociobiological Explanation*  
- Arthur Caplan: “Say It Just Ain’t So: Adaptational Stories and Sociobiological Explanations of Social Behavior”

16. Catch-up and review. *Final Exam: 10:30-12:30, Friday Dec. 10*