Unit I, Goals of this course

1. What are the 4 desired goals/benefits of taking this astronomy course? Attach to each response, one further defining remark.

2. Give a succinct description of the aspect of cosmic perspective offered in each quotation of philosopher Konstantin Kolenda and astronomer Carl Sagan.

Unit II, Background and a Personal Statement on the Teaching of the Science of Astronomy

Wonder why I don’t just jump into some astronomical topic or two at the start of the course? What we cover in the Introductory Course Notes and in the early classes contain much of the most important understandings a science course has to offer. You won’t really “get” astronomy, if you don’t “get” science. And science is an important part of our lives. Astrology is a classic pseudoscience. You want to be educated? The scientifically educated person can tell the difference. The fundamental contribution of education generally is the learning of knowledge and ideas and the learning of how to discriminate amongst them (be a critical thinker).

Unit II offers you some good pedagogical background on my teaching of the science of astronomy. And if you are an education major, this is a good unit for you to read carefully and save for returning to in a few years.
3. According to philosopher Allan Bloom, what is the purpose of the university?

4. Eight recommendations for quality science instruction are listed. As these have been included in the development of this course over the years, I want you to simply list them here.

5. Carl Sagan has written, “Science is much more than a body of knowledge. It is...what? Improvement of the “what” is fundamentally what a science course offers.

Unit III, U.S. Scientific Illiteracy— and on the importance of being scientifically literate

6. Describe the term “cultural literacy,” of which scientific literacy is a part.

7. Fill in the blanks of this quotation of insights by Gerard Piel, Chairman Emeritus of the widely respected magazine, “Scientific American.”

“To too many Americans find themselves coping with life in the man-made world of today in much the same _______ and _______ as their forerunners in the pristine world of nature.

The next generation must be better prepared for ___________. The citizen must have autonomous intelligence, ready to seek and face the ______, immune to _______ _______ and to _______ _______. That is the liberating objective of the ______ of __________ and _______ in our schools.”

8. According to two public surveys on scientific literacy, what fraction of the American adult public is scientifically Illiterate? ____ Oh, and what % is that?...____%
9. In America, religious fundamentalism has led many people to reject what two solid scientific findings?

Unit IV, Science - a Learning Process

Skip this unit here as we will go over this fundamentally important unit in class.

Unit V, Critical Thinking

We will go over the “Eight Aspects of Thinking Critically” in class. You may optionally read the article from which these aspects were taken. You may, further, outline the article for Outside Activity credit. You will be expected to regurgitate them on Test 1.

10. Here, describe black/white thinking.

11. Give the three aspects of scholarship.

12. Tell me in your words what my comment on scholarship is saying.

13. Read the section (E) in the Critical Thinking unit, then copy here my last words in the last paragraph (different font, Section D) on the overarching value of education.

14. In the last paragraph of the final section F, I give a brief argument supporting the offering of what type of course in the high school curricula across the land? ________________.

Unit VI, Pseudoscience/superstition/anti-intellectualism

This fundamentally important section, which complements Unit IV on science, is likewise covered in class. You’ll need to know this section for the test, but we will skip this unit here.
Unit VII, The Popularity of Pseudoscience

Sometimes students don’t get why an introduction to pseudoscience is made. This unit is included to bring to your attention why pseudoscience is relevant and important to not only your understanding of science, but of existence generally. Basically, it permeates our society. On the whole it is simpler to understand and is designed, however unconsciously, to appeal to our fears or emotional needs. This contrasts with science, which is a system of thinking in an objective manner, meaning it delivers the goods, so to speak, without consideration of whether we want them. Our emotion-based needs and assertions are worthless in terms of objective validation and irrelevant to science-established objective truths.

Read what you want of this short unit.

VIII, Dangers of Pseudoscience

The previous unit prepares you for this one.

15. What are the three dangers of pseudoscience belief? Give an example or clarification of each. If you have anything you wish to add, you may do so at the end of your answer to this question.

16. Fill in the blanks of this textbox.

And so:

A scientific claim is not to be accepted because some authority figure (like me) tells you to, or because there is some emotional, spiritual, or religious payoff for you. Your personal reaction to such a claim is ____________ to the claim's degree of objective truth. No, you are to accept this claim because the claim makes _______. You understand the logic, reason, and evidence on which it rests. Moreover, you understand the process by which the claim has come to be ____________, in other words, you understand ________.

17. And at the end of this unit, a well known Nobel Prize winner in physics, Leon Lederman offers several education goals. Write down the first one here, as you note what I have been doing with you in these Intro Notes.
Unit IX, Non-psychological reasons for acceptance of pseudoscience and paranormal claims

18. Explain the Post Hoc fallacy.

19. Ignorance of ___________ and ____________ , coupled with an unfamiliarity with ____________, are obvious contributing factors to widespread acceptance of pseudoscientific, superstitious, paranormal or supernaturalistic beliefs.

20. Misinformation on these topics are spread about by what three groups?

21. And worthy of mention all by itself as a contributing factor is a lack of competency in what other intellectual field? ______________

22. Write down here Plutarch’s insight on coincidence.

23. Stanford mathematician John Allen Paulos demonstrates how the lack of mathematical insight cannot be replaced by “gut feelings.” Many, for example radio pundit Rush Limbaugh, extol their trust in their gut feelings over study and analysis. Read and fill in the blanks from the Intro Notes in the following...

Let’s take, for example, the use of probability mathematics to calculate the probability of two people sharing a birthday (ignoring years) in groups of different sizes. It’s reasonable to start with the fact that there are 365 days in a year (ignoring leap years for the sake of argument). The group size one needs in order to expect at the ____% confidence level of having two people share the same birthday is most likely... (Here’s where you use your gut feeling)... ______ of 365. BUT the math tells us we only need a group of ____ people to have a 50% likelihood of having two people with the same birthday. The calculations are shown in Paulos’s book, Innumeracy. How to check it out? Survey a large number of groups with this number of people, demographically, randomly selected to demonstrate that in half of them, two people will share a birthday and in the other half of them, no birthday is shared.
Unit X, Psychological reasons for acceptance of pseudoscience and paranormal claims

24. Define “subjective reality” and “objective reality.”

25. The memory selection effect is (complete...)

26. Cold Reading is (complete...)

27. Give me two examples from part C1 of how cold readings are facilitated. More are mentioned in part C3, but they are not explained there. You may read the reference given for Outside Activity credit upon handing in an outline, if this interests you.

28. Describe Dr. Ray Hyman’s cautionary insight into cold reading. Just copy the underlined remarks.

29. Give an example of the mental block drawn from your life or someone you know or have seen in the news. Actually, the mental block can hit groups of people, even whole nations. (I don’t want you to use the examples I give; I want you to think a moment about this and come up with an example of your own—it doesn’t need to be profound.

30. Famed science/science fiction author Isaac Asimov comes up with several insights regarding the causal effect of fear and emotional needs on the acceptance of pseudoscientific etc. beliefs. What have rational folks have to offer such believers? (Comment: It’s a tough sell, but if the believers can buy it, they grow by getting more real. Growth is generally considered a good, but it comes with the cost of a loss of innocence.) _______________ _______________

Unit XI, Testing of Psychic Claims

31. Describe the challenge casinos pose to beliefs in psychic powers.