Course Goals:
The main aim of this course is to introduce students to science and medicine in the ancient and early Islamic Mediterranean worlds, as well as in the Western European world of the Medieval and Renaissance periods. We will begin our study with the Pre-Socratic philosophers who first began to theorize about the universe and its origins in scientific rather than religious terms. We will end the course by looking at the way in which medieval European Scholastics and Renaissance Humanists adopted the scientific and medical theories of the ancients and modified them according to their own needs and worldviews. Between these two temporal markers, the 6th century BCE and the 16th century CE, we will trace changes in cosmological, biological, physical, psychological, and medical theories of the classical Greeks and Romans. In order to trace the transfer of these ideas from the ancient world to the medieval West, we will also study the way early Muslims carried on this ancient legacy in the works of Arab and Persian philosophers and practitioners. This course will also explore the boundaries of science and medicine. In other words, students will be asked to consider how practices and ideas that today we might categorize as religion, magic, or superstition could have been accepted as part of mainstream science and medicine in the past. In addition to investigating the scientific and medical theories of this time period, we will also spend some time considering appropriate methods that scholars apply to topics of this sort. This aspect of the course curriculum aims at getting students to consider whether the best way to study the history of science and medicine is in terms of a paradigm of progress, or whether other paradigms for studying history might generate a more significant understanding of the past and the ways in which people sought to explain their world and alleviate their physical and mental suffering.

Book List:
Course Reader – will be available at Graphic Arts by the end of next week
Plato’s Timaeus (Prentice Hall, 1997) Bookstore
Howard Turner, Science in Medieval Islam (University of Texas, 1996) Bookstore
Thomas Kuhn, The Copernican Revolution (Harvard University Press, 1992) Bookstore
Assignments and Grades:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation</td>
<td>10% (Policy explained below)</td>
</tr>
<tr>
<td>Quizzes and periodic writing assignments</td>
<td>20% (Policy explained below)</td>
</tr>
<tr>
<td>Take Home Midterm (due May 8th in class)</td>
<td>30%</td>
</tr>
<tr>
<td>Take Home Final Exam (due June 11th)</td>
<td>40%</td>
</tr>
</tbody>
</table>

Participation Policy:
Active participation in class discussion is worth 10% of your final grade. Although some of the sessions will be run as lectures, every week, at least part of one class will be devoted to small group and full class discussions of the materials read for the week. Students will be given discussion questions ahead of time to guide their reading. And their participation grade will be based not only on their willingness to discuss with the instructor and their fellow students, but also the quality and thoughtfulness of their contributions. Many of these discussions will focus on the theoretical and methodological questions of the course. In other words, the aim of these discussions is to get students to engage with questions about what it means to study the history of medicine and science and the kinds of presuppositions that prevail in modern studies of the past. If you are a person who is hesitant to participate in class and are concerned about this part of your grade, please see me within the first two weeks of class to discuss other opportunities for earning this 10%. This chance will not be available later in the quarter.

Quizzes and Periodic Writing Assignments:
This course is reading intensive. You will be required to read on average up to 100 pages per week, and I will expect you to have read for class beforehand. On the other hand you don’t have to write any research papers and both of your exams are take-home (see below). So I do expect you to take the reading assignments seriously. In order to motivate you to keep up with the reading, I will periodically give you pop quizzes – most likely multiple choice. I will also ask you to write on specific questions that pertain to the readings as a way to start class now and then. This will especially be the case when the class meeting is oriented to discussion (see section on participation). This is also a way for me to gauge where you are at individually before you write your exams, so that I can make sure everyone is on track and likely to succeed on the midterm and final. If I feel that your grade is in jeopardy I will request a meeting with you in order to help you get back on track. Students must be present in class to get credit for these quizzes and assignments. Hence, this is also a way to encourage and record attendance. If you arrive late and the class is taking a quiz, you forfeit your opportunity to take that quiz.

Hence, other than the exams, 30% of your grade is designed to reward you for what you should be doing anyway as a decent, interested student – coming to class, engaging with the material and doing the reading. This should be the easiest part of your final grade to obtain.
**Midterm Exam:**
I will hand out the midterm exam assignment on May 1st in class. It will be due at the beginning of class on Tuesday, May 6th (any exam received after 2:05 p.m. will be counted late one day). I will hand out a set of criteria for a take home exam as the date approaches. The reason I give take home exams is because it forces students to work like real scholars do with their sources. You will have access to your books and class notes. You will be able to concentrate on writing a more polished argument in answer to the exam questions than if you were concerned about memorizing a bunch of facts for an in-class exam. The trade off is that I expect well-written, well-documented polished and edited work. In other words, because you have access to your sources and 5 days to complete the exam, my expectations with regards to the quality of your exams will be high.

**Final Exam:**
The final exam will be cumulative seeing as much of the course focuses on the way Medieval and Renaissance thinkers appropriated the ideas of their predecessors. I will hand out the final exam assignment on Thursday, June 5th in class. It will be due to me in my office between 5 and 6 p.m. on Tuesday, June 10th.

**Cheating and Plagiarism:**
My basic policy on the issue of academic dishonesty is zero tolerance. Please familiarize yourself with the following UCSB link to determine what falls under the definition of academic dishonesty. Although the website indicates TAs, instructors and professors can handle the problem in a number of ways, we are now required to report every incident to the Academic Dean’s office without exception. I will be very clear about what and how to cite your sources on exams so as to help you avoid running afoul of plagiarism. But the responsibility is ultimately yours to ensure that you do not participate in any of the activities listed under “academic misconduct” or “academic dishonesty.”

http://hep.ucsb.edu/people/hnn/conduct/disq.html
Tentative Schedule of Class Meetings

All reading listed under a class meeting must be done prior to the class and is fair game for quizzes and other in-class writing assignments.

Week One:
April 1 – Introduction to the course
April 3 – The Pre-Socratic Philosophers – a new paradigm for thinking about the universe
Reading: Take a look at the Wikipedia article on Thomas Kuhn’s 1962 book *The Structure of Scientific Revolutions*. We will refer to him throughout the course, so it is good to familiarize yourself with his main arguments from the beginning. http://en.wikipedia.org/wiki/The_Structure_of_Scientific_Revolutions
eReserves Pre-Socratic readings
Start reading Plato’s *Timaeus* on the weekend (see instructions below).

Week Two:
April 8 – The Pre-Socratics continued – Pythagoreanism and the Mathematical Universe
Reading: Lloyd, pp. 24-35
April 10 – Plato and the *Timaeus*
Reading: Lloyd, pp. 66-79
Plato, *Timaeus* (see reading instructions below)

Reading Questions for April 3:
1) How could we use Kuhn’s model of paradigm change to study the history of pre-modern science?
2) Choose one of Thales, Heraclitus, or Anaximenes and consider why he posited the element he did as the primordial element from which all other things derive.
3) How do Zeno’s paradoxes “prove” Parmenides view of the universe?
4) How does Empedocles go beyond just discussing the constitution of existent things to explaining how and why things change?

Plato’s *Timaeus* (Instructions for Reading):
You can skim the Introductory Conversation (pp. 3-15)
The sections from pages 16-35 are quite dense and difficult. They contain some confusing mathematical explanations for the proportions and motions the World Soul uses to create the rest of the universe. Don’t worry too much about trying to grasp all the material in these passages. But do look carefully at the sections on pp. 29-33 on time as the moving likeness of eternity and the four kinds of bodies. We will focus most of our attention on pages 45-117.

1) What natural phenomena does Plato seek to explain in terms of his idea of “Necessity,” i.e., the nature of the elements? Choose one natural phenomenon that you found interesting and discuss Plato’s explanation of it. One page, double-spaced typed – refer to the passages using parenthetical citation, for example: (*Timaeus*, 36).
2) In what ways do you see Plato responding to his predecessors, especially Parmenides and Pythagoras?
3) In what sense is the *Timaeus* a scientific work?
Structure of the *Timaeus*

The *Timaeus* is divided into three main sections. The first is concerned with the way reason orders the universe from the top down through the agency of the Demiurge.

1) The Works of Reason: How the Demiurge/the benevolent Maker/the Rational Principle makes the World Soul and all other souls beneath the World Soul all the way down to the human soul. The rational principle that governs the creation process

2) Necessity: What kind of material the Demiurge has to work with and how this constrains what can be made.

3) Rationality and Necessity: The creation of the human being which is a composite of matter ordered by rational principles. This division reflects some of the general principles attributed to Plato in the section on his presuppositions.

Our goal in reading the *Timaeus* will be to emphasize what is new or original about Plato’s natural science and how does he take the ideas of his predecessors and develop them further.

Plato’s Pre-Suppositions (these are general Platonic principles that one finds consistently represented in many of his works)

1) In response to Parmenides’ claim that “it is” (and hence “it is not” cannot be), Plato posits two realms. The first is the realm of being (“it is”) and claims that this realm is purely intelligible and immaterial, hence, changeless, eternal and perfect. The second realm is the realm of becoming (both “it is” and “it is not” together). This is the material realm, the realm in which we live where things come to be and pass away.

2) Soul, mind, intellect have more reality than matter and the participation of the soul in matter clouds its perception of truth.

3) The universe is eternally existing.

4) There is an order to the universe and it is governed by eternal principles in which all things participate in a more and less direct way. Soul or intellect participates more directly and can reflect these eternal principles more accurately.

5) Sometimes Plato calls these principles Forms or Ideas (Greek word “eidos”). These forms may be one or many, but if they are many they are all related. Examples are Truth, Beauty, Goodness, Wisdom, Justice.

6) A human being is a spiritual or intellectual being that has somehow got its soul/intellect entangled with matter. Plato uses metaphors to describe this aspect of his thought, because purely logical discourse cannot capture the entire point.

7) As a result of its nature, the best life for a human being to live is one in which the focus is on the well-being of the soul in order that it might achieve its true knowledge and understanding. Thus it must search for eternal principles.

8) This life, the life of the philosopher, has both moral and political implications as we will see.
Tentative Schedule of Class Meetings

All readings listed under a class meeting must be done prior to the class and are fair game for quizzes and other in-class writing assignments

Week One:
April 1 – Introduction to the course
April 3 – The Pre-Socratic Philosophers – a new paradigm for thinking about the universe
Reading: eReserves Pre-Socratic readings (the readings on Pythagoras can be read for next class)

Week Two:
April 8 – The Pre-Socratics continued – Pythagoreanism and the Mathematical Universe
Reading: eReserves Pre-Socratic readings on Pythagoras and sections from Iamblichus’ *On the Pythagorean Way of Life*
Lloyd, pp. 24-35
April 10 – Plato and the *Timaeus*
Reading: Lloyd, pp. 66-79
Plato, *Timaeus* (instructions will be given for how to read this work without getting bogged down in some of the more difficult parts)

Week Three:
April 15 – Plato’s Timaeus (cont’d)
April 17 – Plato’s student, Aristotle
Reading Lloyd, pp. 99-124
Edward Grant, *The Foundations of Modern Science in the Middle Ages*, pp. 53-69

Week Four:
April 22 – Aristotle’s biology
Reading Reader, Aristotle sections, pp. 1-34
April 24 – Ancient Greek and Roman Medicine – Theories of Health and the Body
Reading Lloyd, 50-65
Reader – Hippocrates, Galen, “Galen” in *Greek Science after Aristotle* (Lloyd), pp. 35-75

Week Five:
April 29 – Ancient Medicine and Healing in Practice - Between science and religion
Reading Reader – Vivian Nutton, Chapter; Aelius Aristides, Epidaurian Miracle Inscriptions, Amulets and Ritual Descriptions on Papyri, pp. 77-111
May 1 – Ancient Astronomy
Reading Lloyd, pp. 80-98
*Midterm Exam assignment handed out in class*

Week Six:
May 6 – Science in Early Islam
Reader, Avicenna, “On the Formation of Stones and Mountains,” pp. 113-123
*Midterm Exam due at the beginning of class*
May 8 – Islamic Medicine and Biology
Reading Turner, pp. 131-188
Reader, Hunain ibn Ishaq, Avicenna, 129-144

Week Seven:
May 13 – Early Medieval Science and the Rise of the Medieval University
Reading Edward Grant, *The Foundations of Modern Science in the Middle Ages*, pp. x-xiv (Preface), 18-53
Reader, Hildegard of Bingen, List of translations, pp. 145-161

May 17 – Medieval Medicine
Reading Reader, pp. 183-203

**Week Eight:**
May 20 – The Sub-lunar sphere – Medieval Zoology, Biology and “Chemistry”/Alchemy
Reading Grant, pp. 127-131, 137-142, 168-206
Reader, Albert of Saxony, Themon, son of the Jew, Albertus Magnus, pp. 163-182

May 22 – Alchemy (Guest Lecture by Olivier Dufault) Readings will be handed out ahead of time
Reading Reader, Paracelsus (alchemy), pp. 205-228
(Review sections on Avicenna)

**Week Nine:**
May 27 – Exploration of Other Worlds and its Impact on Renaissance Science
Reading Reader, pp. 229-256
May 29 – Renaissance Medicine
Reading Reader, Vesalius, Paracelsus (medicine), pp. 257-282

**Week Ten:**
June 3 – Renaissance Astronomy – Theories of a Heliocentric Cosmos
Reading Thomas Kuhn, *The Copernican Revolution*,
June 5 – Conclusions
Final Exam assignment handed out in class
June 10 – Final Exam due between 5 and 6 p.m. in my office, HSSB 3224
History 206A/Environmental Studies 108A – Reading Assignments

All the readings listed for each day must be done prior to class

**Week One:**
April 3
April 5 - Reader pp. 1-22

**Week Two:**
April 10 – Reader pp.23-25
April 12 – Plato’s *Timaeus*; Lindberg pp. 39-43

**Week Three:**
April 17 – Reader pp 27-28; 61-73. ; Lindberg pp. 51-58
April 19 – Reader pp.29-60

**Week Four:**
April 24 – Reader pp. 75-105 ; Lindberg pp. 111-131
April 26 – no class

**Week Five:**
May 1 – Vivian Nutton chapter (photocopy); Reader pp. 107-123
May 3 – Lindberg pp. 85-110; 135-159

**Week Six:**
May 8 – Reader pp. 125-133; 169-173; Lindberg pp. 161-82
May 10 – Reader pp. 135-150

**Week Seven:**
May 15 – Reader pp. 151-167; Lindberg pp. 206-213
May 17 – Reader pp. 175-180

**Week Eight:**
May 22 – Reader pp.181-190; 203-206; Lindberg pp. 281-315
May 24 – Reader pp.191-201; 207-241; Lindberg pp. 317-353

**Week Nine:**
May 29 – Reader pp.243-271; Debus TBA
May 31 – Reader pp.271-313; Debus TBA

**Week Ten:**
June 5 –Debus TBA
June 7
Course Goals:
The main aim of this course is to introduce students to science and medicine in the ancient and early Islamic Mediterranean worlds, as well as in the Western European world of the Medieval and Renaissance periods. We will begin our study with the Pre-Socratic philosophers who first began to theorize about the universe and its origins in scientific rather than religious terms. We will end the course by looking at the way in which medieval European Scholastics and Renaissance Humanists adopted the scientific and medical theories of the ancients and modified them according to their own needs and worldviews. Between these two temporal markers, the 6th century BCE and the 16th century CE, we will trace changes in cosmological, biological, physical, psychological, and medical theories of the classical Greeks and Romans. In order to trace the transfer of these ideas from the ancient world to the medieval West, we will also study the way early Muslims carried on this ancient legacy in the works of Arab and Persian philosophers and practitioners. This course will also explore the boundaries of science and medicine. In other words, students will be asked to consider how practices and ideas that today we might categorize as religion, magic, or superstition could have been accepted as part of mainstream science and medicine in the past. In addition to investigating the scientific and medical theories of this time period, we will also spend some time considering appropriate methods that scholars apply to topics of this sort. This aspect of the course curriculum aims at getting students to consider whether the best way to study the history of science and medicine is in terms of a paradigm of progress, or whether other paradigms for studying history might generate a more significant understanding of the past and the ways in which people sought to explain their world and alleviate their physical and mental suffering.

Book List:
Course Reader – will be available at Graphic Arts by the end of next week
Plato’s Timaeus (Prentice Hall, 1997) Bookstore
Howard Turner, Science in Medieval Islam (University of Texas, 1996) Bookstore
Thomas Kuhn, The Copernican Revolution (Harvard University Press, 1992) Bookstore
Assignments and Grades:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation</td>
<td>10%</td>
</tr>
<tr>
<td>Quizzes and periodic writing assignments</td>
<td>20%</td>
</tr>
<tr>
<td>Take Home Midterm (due May 8th in class)</td>
<td>30%</td>
</tr>
<tr>
<td>Take Home Final Exam (due June 11th)</td>
<td>40%</td>
</tr>
</tbody>
</table>

Participation Policy:
Active participation in class discussion is worth 10% of your final grade. Although some of the sessions will be run as lectures, every week, at least part of one class will be devoted to small group and full class discussions of the materials read for the week. Students will be given discussion questions ahead of time to guide their reading. And their participation grade will be based not only on their willingness to discuss with the instructor and their fellow students, but also the quality and thoughtfulness of their contributions. Many of these discussions will focus on the theoretical and methodological questions of the course. In other words, the aim of these discussions is to get students to engage with questions about what it means to study the history of medicine and science and the kinds of presuppositions that prevail in modern studies of the past. If you are a person who is hesitant to participate in class and are concerned about this part of your grade, please see me within the first two weeks of class to discuss other opportunities for earning this 10%. This chance will not be available later in the quarter.

Quizzes and Periodic Writing Assignments:
This course is reading intensive. You will be required to read on average up to 100 pages per week, and I will expect you to have read for class beforehand. On the other hand you don’t have to write any research papers and both of your exams are take-home (see below). So I do expect you to take the reading assignments seriously. In order to motivate you to keep up with the reading, I will periodically give you pop quizzes – most likely multiple choice. I will also ask you to write on specific questions that pertain to the readings as a way to start class now and then. This will especially be the case when the class meeting is oriented to discussion (see section on participation). This is also a way for me to gauge where you are at individually before you write your exams, so that I can make sure everyone is on track and likely to succeed on the midterm and final. If I feel that your grade is in jeopardy I will request a meeting with you in order to help you get back on track. Students must be present in class to get credit for these quizzes and assignments. Hence, this is also a way to encourage and record attendance. If you arrive late and the class is taking a quiz, you forfeit your opportunity to take that quiz.

Hence, other than the exams, 30% of your grade is designed to reward you for what you should be doing anyway as a decent, interested student – coming to class, engaging with the material and doing the reading. This should be the easiest part of your final grade to obtain.
**Midterm Exam:**
I will hand out the midterm exam assignment on April 30th in class. It will be due at the beginning of class on Tuesday, May 5th (any exam received after 2:05 p.m. will be counted late one day). I will hand out a set of criteria for a take home exam as the date approaches. The reason I give take home exams is because it forces students to work like real scholars do with their sources. You will have access to your books and class notes. You will be able to concentrate on writing a more polished argument in answer to the exam questions than if you were concerned about memorizing a bunch of facts for an in-class exam. The trade off is that I expect well-written, well-documented polished and edited work. In other words, because you have access to your sources and 5 days to complete the exam, my expectations with regards to the quality of your exams will be high.

**Final Exam:**
The final exam will be cumulative seeing as much of the course focuses on the way Medieval and Renaissance thinkers appropriated the ideas of their predecessors. I will hand out the final exam assignment on Thursday, June 4th in class. It will be due to me in my office between 4 and 5 p.m. on Tuesday, June 9th.

**Cheating and Plagiarism:**
My basic policy on the issue of academic dishonesty is zero tolerance. Please familiarize yourself with the following UCSB link to determine what falls under the definition of academic dishonesty. Although the website indicates TAs, instructors and professors can handle the problem in a number of ways, we are now required to report every incident to the Academic Dean’s office without exception. I will be very clear about what and how to cite your sources on exams so as to help you avoid running afoul of plagiarism. But the responsibility is ultimately yours to ensure that you do not participate in any of the activities listed under “academic misconduct” or “academic dishonesty.”

http://hep.ucsb.edu/people/hnn/conduct/disq.html
**Tentative Schedule of Class Meetings**

**All readings listed under a class meeting must be done prior to the class and are fair game for quizzes and other in-class writing assignments**

**Week One:**
- March 31st – Introduction to the course
- April 2 – The Pre-Socratic Philosophers – a new paradigm for thinking about the universe
  
  **Reading:** eReserves Pre-Socratic readings (the readings on Pythagoras can be read for next class)

**Week Two:**
- April 7 – The Pre-Socratics continued – Pythagoreanism and the Mathematical Universe
  
  **Reading:** eReserves Pre-Socratic readings on Pythagoras and sections from Iamblichus’
  *On the Pythagorean Way of Life*
  Lloyd, pp. 24-35
- April 9 – Plato and the *Timaeus*
  **Reading:** Lloyd, pp. 66-79
  Plato, *Timaeus* (instructions will be given for how to read this work without getting bogged down in some of the more difficult parts)

**Week Three:**
- April 14 – Plato’s *Timeaus* (cont’d)
- April 16 – Plato’s student, Aristotle
  **Reading** Lloyd, pp. 99-124
  Edward Grant, *The Foundations of Modern Science in the Middle Ages*, pp. 53-69

**Week Four:**
- April 21 – Aristotle’s biology
  **Reading** Reader, Aristotle sections
- April 23 – Ancient Greek and Roman Medicine – Theories of Health and the Body
  **Reading** Lloyd, pp. 50-65
  Reader – Hippocrates, Galen, “Galen” in *Greek Science after Aristotle* (Lloyd)

**Week Five:**
- April 28 – Ancient Medicine and Healing in Practice - Between science and religion
  **Reading** Reader – Vivian Nutton, Chapter; Aelius Aristides, Epidaurian Miracle
  Inscriptions, Amulets and Ritual Descriptions on Papyri
- April 30th – Ancient Astronomy
  **Reading** Lloyd, pp. 80-98

**Midterm Exam assignment handed out in class**

**Week Six:**
- May 5 – Science in Early Islam
  Reader, Avicenna, “On the Formation of Stones and Mountains”

**Midterm Exam due at the beginning of class**

**May 7 – Islamic Medicine and Biology**
- **Reading** Turner, pp. 131-188
  Reader, Hunain ibn Ishaq, Avicenna

**Week Seven:**
- May 12 – Early Medieval Science and the Rise of the Medieval University
Reading  Edward Grant, The Foundations of Modern Science in the Middle Ages, pp. x-xiv (Preface), 18-53
Reader, Hildegard of Bingen, List of translations

May 14 – Medieval Medicine
Reading  Reader

Week Eight:
May 19 – The Sub-lunar sphere – Medieval Zoology, Biology and “Chemistry”/Alchemy
Reading  Grant, pp. 127-131, 137-142, 168-206
Reader, Albert of Saxony, Themon, son of the Jew, Albertus Magnus

May 21 – Alchemy (Guest Lecture by Olivier Dufault)
Reading  Reader, Paracelsus (alchemy)
(Review sections on Avicenna)

Week Nine:
May 26 – Exploration of Other Worlds and its Impact on Renaissance Science
May 28 – Renaissance Medicine
Reading  Reader, Vesalius, Paracelsus (medicine)

Week Ten:
June 2 – Renaissance Astronomy – Theories of a Heliocentric Cosmos
Reading  Thomas Kuhn, The Copernican Revolution,
June 4 – Conclusions
Final Exam assignment handed out in class
June 9 – Final Exam due between 4 and 5 p.m. in my office, HSSB 3224