This course will deal with a variety of activities that we can consider under the heading of science, ranging from the practical techniques of Antiquity and the Middle Ages to the self-consciously rational science of the Greeks and its development in Rome, Islam, and the Latin West.

We will stress both the scientific ideas themselves as well as the ways in which various approaches to the study of nature served the societies in which they arose, both in a practical utilitarian sense and in the broader sense of contributing to their world-view. To do this we will examine how and why various institutions, practices, and attitudes contributed to the development, preservation, and transmission of knowledge of nature. More importantly, we will try to come to some understanding of what these scientific ideas meant to the people who lived in particular times and places.

This term I plan to have us take some time looking at the writings of one particular medieval scholar, the eighth-century English Monk, Bede of Jarrow (sometimes known as the Venerable Bede). Bede was prolific and important, writing in the fields that we would classify as science, history, and religion. George Sarton, a noted historian of science, called the eighth century the "Age of Bede." Bede's *Ecclesiastical History* ranks with Gregory of Tours' *History of the Franks* as one of the principal narratives of early medieval history and his scriptural commentaries, while not as distinctive, form the most voluminous part of his writings.

Bede will provide us with an opportunity to come to grips with a man who held several complementary – and perhaps to us, incompatible – approaches to understanding the world in which he lived. He was a careful and objective scientist and historian, yet from his Christian perspective he saw everyday occurrences as redolent of deeper meanings. Accepting the beliefs of other peoples as intelligible, for after all, they were as intelligent as we are, is essential to this inquiry into ancient and medieval science. In our historical inquiry we will examine the basis of those beliefs, how they came to hold them, and how those beliefs made sense to them. This is not easy; many people have great difficulty taking the ideas of different
cultures seriously, but if we are to be really understand what medieval people believed, we have to do just that. One of my favorite writers, Ursula Le Guin, wrote:

To learn a belief without belief is to sing a song without the tune.
A yielding, an obedience, a willingness to accept these notes as the right notes, this pattern as the true pattern, is the essential gesture of ... understanding. The gesture need not be permanent, a lasting posture of the mind or heart; yet it is not false. It is more than the suspension of disbelief needed to watch a play, yet less than a conversion. It is a position, a posture in the dance.


This willingness to accept – at least as a temporary posture – the beliefs of ancient and medieval scholars as valid representations of the order of the universe is a valuable – and probably essential – tool if we are to understand ancient and medieval science.

**Written Assignments:** All students will be expected to write two short essays for this course (graduate students will be required to write three). The first assignment will be an essay review (1000-1200 words) which will identify and discuss shared themes found in two books written by the English Monk Bede of Jarrow. These books are Bede's major treatise on computus, *The Reckoning of Time* and either his scriptural commentary, *On the Temple*, or his *Ecclesiastical History of the English People*. Before reading Bede it would be helpful to look at his discussion of allegories in his essay "Concerning Figures and Tropes," which will provide some insights into his method of exposition. The other assignment will be a book review (700-900 words) of either my book on Early Medieval Astronomy or Darrell Amundsen's collection of essays on Ancient and Medieval Medicine. Graduate students will be required to write reviews on both books.

**Exams:** The Mid-term Exam will be on Tuesday, Feb. 24. It will consist of one essay question and a number of short identification questions. The Final Exam will be held as scheduled in the University Schedule of Examinations from 8:00-10:00 AM on Tuesday, May 4 in the regular classroom. It will be similar to the mid-term, consisting of two essay questions, one dealing with Bede of Jarrow and one comprehensive question, and a number of short identification questions. A study guide, including the essay questions to appear on the exam, will be passed out about a week before each exam.

**Attendance:** I expect students to attend class – examinations will be based quite heavily on material presented in class. In addition, I do take attendance almost every day of class.

**Late Assignments:** Book reviews will be due on the day assigned in the syllabus. One letter grade will be deducted for late assignments. Make-up examinations will generally be somewhat more difficult than the exam given on the assigned date.

**Academic Ethics:** Academic research takes as one of its guiding principles the assumption of honesty; deceit of all kinds is one of the cardinal academic sins. I expect students' writing to represent their own work. All cases of plagiarism will be reported to the dean in accordance with the formal procedures outlined in the Undergraduate Catalog. Depending on the severity of the offense, plagiarism will lead to anything from a failing grade in the assignment to a failing grade for the course. Flagrant offenders can suffer additional university penalties. If you don't know what plagiarism is, find out.
Grades for the course will be computed on the following basis.

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<th>Undergrads</th>
<th>Grad Students</th>
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<tr>
<td>Attendance</td>
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<tr>
<td>Mid-Term Exam</td>
<td>125</td>
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<td>Bede Essay Review</td>
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<td>Reviews</td>
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<td>Final Exam</td>
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<td><strong>TOTAL POINTS</strong></td>
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Tentative Schedule of Classes

Jan. 15  What was "Science" in Antiquity and the Middle Ages?

Jan. 20-22  Greek Philosophical Cosmology
  Grant, *Foundations*, pp. 54-69.

Jan. 27  Science in Greek Society
  Rochberg, in Shank, *Scientific Enterprise*, pp. 23-29

Jan. 29 - Feb. 3  Ancient Mathematical Astronomy

Feb 5  Science and Christianity

Feb 10  The Late Roman Scientific Tradition

Feb 12  Remedies and Healing in Antiquity and the Early Middle Ages
  Temkin, in Shank, *Scientific Enterprise*, pp. 111-123.

Feb 17  Monastic Timekeeping and Practical Astronomy

Astronomy and Numbers in the Age of Bede.

For this section of the course, we will be reading and discussing a number of books by Bede of Jarrow.

**Feb 19 Mar 4**  Bede's model of interpretation.

The chief issue in this discussion will concern the modes of interpretation that Bede applies to his studies. Some of Bede's discussion may seem to us to be wild eyed speculation, but he is engaged in studying texts – and nature – within accepted scholarly frameworks. One such framework – commonly applied to the study of the bible – involves the multiple levels of meaning that can be found in a single text. Since this framework appears elsewhere in his work, understanding how he applies it to the study of the bible will help us understand what he's doing elsewhere.

**Essay review of Bede's works due**

Feb 24  Mid Term Exam

Feb 26  Mar 11  Bede on History.

Bede's *Ecclesiastical History* presents his general understanding of the place of the English in the framework of Christian history, and also deals with one of his major scientific concerns: the method of computing the date of Easter. We will examine this text to consider Bede's evaluation of evidence, his broad framework of history, and the factors lying behind the scientific investigation found in his book *On the Reckoning of Time*. Students having read the *Ecclesiastical History* should be prepared to discuss this text.

Mar 23  Bede on Scripture.

Bede's *On the Temple* is a typical example of his scriptural interpretation. His interpretation employs the historical, figurative, moral, and anaagogical modes of interpretation he had discussed earlier in his "Concerning Figures and Tropes." We will discuss the role how mathematical and scientific concepts contribute to his allegorical interpretation of scriptures. Students having read *On the Temple* should be prepared to discuss this text.

Mar 25-30  Bede on Nature.

Required Reading

Bede, *The Reckoning of Time* (trans. Wallis). Groups of students will be assigned special responsibility for specific sections of this work which will be discussed on each day of class.

Mar. 13-21  Spring Break

Mar 23  Apr 1  Astronomy and the Carolingian Renaissance


Mar 25  Feb 19  Astrology as a Science?


Thorndike, in Shank, *Scientific Enterprise*, pp. 239-244.


Feb 26 - Mar 30 - Apr 12  Science in the Islamic World


Apr 6  Translations and the Twelfth Century Renaissance

Grant, *Foundations*, pp. 18-32

Apr 8  The Medieval University


Apr 13  Aristotle and the Theologians

Grant, *Foundations*, pp. 70-85.

Apr 15  The Nature of Medieval Natural Philosophy

Apr 20-22  Astronomy and Cosmology in the Medieval Universities
Grant, in Shank, *Scientific Enterprise*, pp. 182-203.
**Book review(s) of Amundsen or McCluskey due Tuesday, April 20**

Apr 27  Mathematics and the Sciences in the Middle Ages

Apr 29  The Legacy of Medieval Science

Tues May 4, 8:00-10:00  Final Exam