PHIL 486FL: PHILOSOPHY, CHRISTIANITY, & SCIENCE FROM ANTIQUITY TO THE RENAISSANCE
MTR 10:30-11:30 AM (time slot C)  Course Website: http://blackboard.gonzaga.edu
Spring 2016  Gonzaga in Florence  David H. Calhoun  calhoun@gem.gonzaga.edu

COURSE DESCRIPTION
It is a commonplace of contemporary thought that Christianity and science have a relationship that is contentious as best, outright war at worst. Many people trace the conflict between Christianity and science back to the emergence of modern natural science in the 1500s and 1600s, when according to the story heroic scientists such as Copernicus and Galileo battled entrenched opposition largely concentrated in church authority in order to bring our understanding of the natural world out of the Dark Ages. But is this story true? Are Christianity and science diametrically opposed?

In this course we will explore this controversy by examining the historical roots of the relationship between Christianity and science and by following the story to the early modern period. Our approach will be to investigate the emergence of systematic reflection on the cosmos and natural phenomena in the ancient world and the influence of Christianity on this enterprise from its inception through the late Renaissance.

Since there is a wealth of artistic and historical documentation of Christianity and science during the medieval and early modern periods in the Florence area, the course will feature field trips to sites that will shed light on our studies. NOTE: these field trips will replace class meeting on the Thursdays that they occur (Thurs Feb 2, Thurs Feb 16, and Thurs Mar 30), and will take place at a different time, from about 1:45-3:45 pm. More information will be available at the beginning of the semester. Please take note of these field trips when planning travel for the semester.

Given the complexity of the subject matter, this course is by design and necessity interdisciplinary in approach. Much of our attention will be devoted to historical events and processes, and to the development of ideas about nature and the cosmos over time. We will explore the history and development of Christianity as a systematic view and the emergence of science from its roots in what the ancients and medieval thinkers called "philosophy of nature." At the same time, we will employ philosophical tools to critically reflect on arguments about science and scientific method, and to clarify the philosophical assumptions at work in various competing worldviews.

GOALS OF THE COURSE
Philosophical and Historical Knowledge
The course is intended to help students cultivate a sophisticated knowledge of the origins of science in ancient philosophical reflections about reality, of science as a human enterprise and systematic attempt to understand the world, of the nature of Christianity as a systematic worldview, and of the complex relationships between these human activities. Students will explore the range of possible ways to understand the religion-science relationship beyond the standard dichotomies (religion vs. science, faith vs. reason). Further, we will seek to uncover the assumptions that are often in play in public confrontations between religion and science. Finally, we will learn about Florentine culture as it sheds light on the development of Christianity and science.

Philosophical Development
An important objective of the course is to promote philosophical inquiry on the part of students by active interaction with significant philosophical texts and ideas. The course begins with the
assumption that every human being is a philosopher, a person who cares about what is true, valuable, and meaningful and who recognizes the need to work on his or her worldview. The ideas addressed in this course accordingly are intended to offer students the opportunity to better understand their views and to develop them with greater clarity and consistency.

**Academic and Intellectual Skills**

As a result of the work in this course, students should be able to read philosophical texts and philosophically oriented popular texts more closely and carefully, to understand those texts more fully, and to express their positions more clearly both verbally and in writing.

**COURSE REQUIREMENTS / GRADING**

1. **Class attendance and participation** (10%). Since philosophy is a dialogic discipline that is best studied by reading and discussing, students must be prepared for class each day and participate in class discussions. Good participation will help your grade, while absences and poor participation will lower your grade. The Gonzaga in Florence attendance policy will be enforced (see below); any absences beyond one week will result in a grade penalty; six absences will result in a grade of F for the course. See "Classroom Expectations / Decorum" below for more detail regarding my expectations for class discussion.

2. **Reading assignment quizzes** (15%). Because the reading assignments are such an integral part of this course, I will give very basic quizzes on the reading assignments periodically throughout the course. The quizzes will be multiple choice or short-answer format, and will take place at the beginning of class. The lowest quiz grade will be dropped. **No make-ups will be allowed for missed quizzes.** If you miss a quiz, the zero grade will be counted as your dropped quiz grade.

3. **Midterm Exam** (20%). An exam covering topics from the first half of the course. The exam will include multiple choice, short answer, and essay questions. The exam will be distributed via email; answers will be due one week later during Midterm Week (see the schedule for details). Students will be allowed to consult notes and books and may discuss the exam questions with one another. However, all answers submitted must be the student's own answers, and the Midterm, like all other graded exercises for the course, is governed by the expectations set out in the Academic Honesty Policy.

4. **Disputation Participation and Summary** (10%). Toward the end of the course, we will devote one class day to a disputation, conducted something like the medieval model, on the thesis, "Did medieval Christianity, on balance, impede the development of early modern natural science?" Students will be required to prepare a summary of their position in a format supplied by the instructor, and to participate in the disputation in class. The summary will be due at the beginning of class; please bring two copies to class (one to turn in and one to refer to during the class discussion).

5. **Argumentative Paper** (20%). Each student must write one argumentative paper for the course, 1500-1700 words in length, on a topic suggested by the instructor or devised by the student with the instructor's approval. Regardless of the topic, the paper must be argumentative, with a clearly articulated thesis, evidence from readings and class discussion to support the thesis, and clearly explanation of and response to the most important objection(s) that might be raised against the thesis. The paper will be graded according to the parameters established in the **Paper Evaluation Guidelines** (available on Blackboard). Papers are due in class on the date specified in the course schedule. **Essays submitted late will receive a grade penalty.**

6. **Final Exam** (25%). The format for the final exam will follow the pattern of the midterm exam, except that it will be in-class rather than take-home. The content of the final will focus on the second half of the course, but some questions will involve review of or comparison to material from the first half.
GONZAGA IN FLORENCE ATTENDANCE POLICY

Attendance is taken at the beginning of class from the first day of the semester. The student entering class after attendance is taken has to contact the professor at the end and announce his/her presence. However, this does not mean that coming late is accepted. Two late arrivals may be excused, three turn automatically into an absence and will affect the attendance and participation part of the final grade.

Students can miss one week’s work, irrespective of the course formula (three sessions, two sessions, one session). It is their responsibility to make up for the missed work. If they miss a quiz or a report they are not allowed to have it at another time, unless the absence is for certified medical reasons and the professor and Dean agree.

More than one week’s work missed is going to be penalized as follows:
- One extra absence: by lowering the attendance and participation grade
- Two extra absences: by lowering the final grade by a whole letter grade
- Three extra absences: by grading the whole course F

CLASSROOM EXPECTATIONS / DECORUM

Philosophical inquiry is a dialogic enterprise, and a difficult one at that. If we care about exploring what is true, and critically examining our ideas and arguments, we must cultivate concentration, focus, and rigorous thinking, and must pay careful attention to one another in discussion. To achieve these objectives, I find it important to foster the most suitable possible environment for philosophical inquiry. I also expect that students will conscientiously and responsibly prepare for class by reading, reviewing, and thinking about the assigned reading material for each class meeting.

These requirements for a successful classroom have specific implications for classroom use of technology. A further consideration in the matter is that empirical research regarding use of technology has generated strong evidence supporting several important conclusions: (1) use of laptops for classroom note-taking is generally less effective for comprehension and retention of material than hand-written notes; (2) availability of non-course related technology resources (email, social media, and so forth) is often distracting to students; and (3) student use of technology distracts students seated nearby. For these reasons, I generally discourage the use of laptops in class, and do not allow cell phones or texting at all. Students who wish to use laptops in class must discuss this with me outside of class and receive express permission in order to do so. The one exception to this general policy is that students may use laptops or e-readers to access handout readings during class while those particular readings are the subject of discussion.

ACADEMIC HONESTY

Honesty is a key virtue in a community of scholars. The University has expressed its commitment to this value by adopting an "Academic Honesty Policy." It is your responsibility to be familiar with and abide by this policy. Students will be required to affirm their commitment to academic honesty by signing a pledge distributed via email at the beginning of the course.

The most troublesome area for students is plagiarism. To plagiarize is to take the ideas or words of another and to present them as one's own. To avoid plagiarizing, students must, at the least, acknowledge the sources of ideas or wordings used in written work. Moreover, students should seek to move beyond their sources and to do original work. In the case of Discussion Board posts and papers, students must give credit for ideas or specific wordings that are not their own by citing the source in a footnote or endnote. If you are unsure whether or not you need to give credit in a citation, cite! In the case of take-home exams, you need not cite discussions you have had with other students or references to your texts or notes. However, you
should ensure that every answer you submit is your own. It will constitute academic dishonesty to divide up exams and share answers with other students.

A grade of "0" (zero) will be the typical penalty for any assignment involving academic dishonesty. In some cases, a more severe penalty (as discussed in the University's "Academic Honesty Policy") may be imposed. The instructor reserves the right to submit copies of student written work to a plagiarism detection site such as TurnItIn.com.

**REQUIRED TEXTS**


Handout reading packet

**NOTE**: in order to use the most relevant available material, and to minimize course text costs, this course uses a number of handout readings. I strongly urge that you bring the hard copies of handouts to class on the days that we discuss them. You are responsible for reading and reflecting on the handouts no less than the purchased course texts.

**TENTATIVE COURSE SCHEDULE**

This schedule is tentative and therefore may be adjusted during the semester by announcement in class. Readings must be completed **before** class on the day assigned. Field trips noted in the schedule may occur at times other than regularly scheduled class meeting times. Please be flexible, especially as we work out logistics for field trips related to content of the course.

**M 1/9**

**course intro, syllabus, plan**

What is science? Why is science important to human beings? What conditions are important for the rise of scientific thinking? What relationship do we think holds between Christianity and science? Why? Why investigate the origins of philosophy, science, and Christianity?

READ (after class): *BWS* 1-12, skim *BWS* 12-20

**T 1/10**

from myth to philosophy: pre-Socratic Greek cosmology

READ: *BWS* 21-34; handout excerpts from pre-Socratic philosophers

How do the ideas about nature and the cosmos advanced by the pre-Socratic philosophers differ from their predecessors such as Homer and Hesiod? What is the difference between myth and philosophy, even primitive philosophy? In what ways are myth and philosophical reflection similar?

**Th 1/12**

Plato’s metaphysics and cosmology

READ: *BWS* 34-44, 86-92; handout excerpts from Plato’s *Phaedo, Republic, and Timaeus*

What seems to motivate Plato’s view of reality? Why does he think that “forms” are real, and indeed are the most real things? What is the relationship between forms and the sensible world? What view does he have of the cosmos? How do his views differ from his pre-Socratic predecessors? What are the implications of Plato’s view for the value of scientific investigation of the world of sense perception?

**M 1/16**

Aristotle’s theory of reality / metaphysics / epistemology
How does Aristotle’s theory of reality differ from Plato’s? What is *hylomorphism*? How, in Aristotle’s view, do we come to know truth? What is necessary for genuine scientific knowledge?

What is Aristotle’s view of the cosmos? How does his cosmology link to his overall philosophical outlook? What is the difference between the earthly realm (the *sublunar*) and the heavens? What is the Unmoved Mover, and what role does he play in the cosmos?

How does Aristotle’s conception of soul reflect his overall hylomorphism? How does it differ from our intuitive conception of soul and from Plato’s view? What approach does Aristotle think must be taken to effectively study nature? How does his approach differ from such predecessors as Democritus and Empedocles? What sort of approach did Aristotle take to experimentation and observation of nature?

What organized schools developed in Athens in the Hellenistic period, and what views did they promote? How did Epicurus develop atomistic ideas? How did Stoic views adapt and develop the ideas of the pre-Socratics and Aristotle? Was Aristarchus’ heliocentrism reasonable given the evidence available in his time (3rd century B.C.)? Why or why not? What was Eratosthenes’ great achievement? What astronomical ideas offered by Ptolemy mark the culmination of centuries of celestial observation and development of mathematical and geometric tools?

What are the philosophical developments in the Roman Empire in the first few centuries AD? How are Cicero and Pliny illustrative figures? What is the overall outlook of Neo-Platonism? How does Neo-Platonism mesh together ideas from Plato, Aristotle, the Stoics, and other thinkers?

What are the key concepts about God and the world that are emphasized in the Jewish and Christian scriptures? What relation does God have to nature? What is the role of reason in God’s self-revelation? How does the understanding of God’s relationship to nature differ from ancient pagan cultures and from the Greeks and Hellenists?

How did the early Christian church draw from both scripture and pagan philosophy in developing ideas about the nature of God and God’s relationship to the created universe? What interest did the early church have in understanding nature? What competing positions did early Christian thinkers take regarding philosophy and
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philosophical study of nature, and why? What key principles did early Christian thinkers devise for relating religion, philosophy, and science?

T 1/31 education in early Christianity, Augustine
READ: BWS 150-62; St Augustine, excerpts from On Genesis, Book I (handout)
What was the stance of the early Christian church toward formal education, and why?
What educational institutions developed, and what did they emphasize? What is St. Augustine's purpose in commenting on the book of Genesis? Why is development of ideas in natural philosophy important to the Christian author? What role, generally, does Genesis and the overall theme of creation seem to have for early Christians?

Th 2/2 field trip to the Battistero di San Giovanni (details TBA)

M 2/6 medieval developments: monasteries, schools, universities
READ: BWS 193-224
What developments in Christian learning took place under Charlemagne? What was the state of Christian learning by 1000 AD? What themes and topics were important to scholars in this time? How did access to Greek and Arabic texts affect Christian learning? What promoted the rise of universities, and what were they like?

T 2/7 the recovery of classical learning, Albertus Magnus (Albert the Great)
READ: BWS 225-41; Albertus Magnus, excerpts from On Animals (handout)
What were the effects of widened access to Greek and Arabic texts in the 1200s?
What particular effect did transmission and translation of the works of Aristotle have? What conflicts for Christian thinkers were raised by the power of Aristotle's philosophical system? How did Albertus Magnus synthesize Aristotle with Christianity? What particular steps did they take to make Aristotle fit? What is the handmaiden metaphor and why was it important?

Th 2/9 Thomas Aquinas on philosophical method, God, and human beings
READ: Hakim, An Ox Who Bellowed (handout)
READ: Thomas Aquinas, excerpts from Kreeft, Summa of the Summa (handout)
What Aristotelian ideas reappear in Thomas Aquinas' philosophical system? What relationship does Thomas think holds between theology and philosophy? What can we know about God by reason alone? Can we know that God exists? How does Thomas' view of human beings compare to Aristotle's? Does he agree that the human soul ceases to exist at the death of the body? Why or why not?

M 2/13 Thomas Aquinas on creation
READ: BWS 241-43; Thomas Aquinas, excerpts from Writing on the Sentences of Peter Lombard (handout)
How does Thomas Aquinas further the project of synthesizing Aristotle and Christianity? What is Thomas' idea of creation, and how does he argue that an Aristotelian conception of God as first cause is how does Thomas develop and alter the idea of Augustine that philosophy is the handmaid of theology? How do the arts and sciences fit together in a great system of Christian learning?

T 2/14 Radical Aristotelianism
READ: BWS 243-53; Etienne Tempier, Bishop of Paris, The Condemnation of 1277 (handout)
What different groups arose in response to renewed access to classical texts, especially those of Aristotle? Who were the radical Aristotelians, what issues did they promote? What was the church's response to the challenges raised by Aristotelian philosophy? What were the Condemnations and what effects did they have?
Th 2/16  **field trip to Capella Spagna di Santa Maria Novella** (details TBA)

M 2/20  Edward Grant, "Science and Theology in the Middle Ages" (Blackboard)
According to Grant, what were the effects of the introduction of Aristotelian works to Latin Christendom in Europe? What particular tensions between theology and scientific inquiry were caused by this event? What specific claims and methods promoted by Aristotelian thinking were at odds with settled theological claims? In the end, does it seem that theology and natural philosophy / science were in conflict in the late Medieval period? How does Grant view compare to Lindberg on these matters?

**Midterm exam distributed by email**

T 2/21  review and catch-up

REVIEW: Thomas Aquinas, excerpts from Kreeft's *Summa of the Summa*; Thomas Aquinas, excerpts from *Writings on the Sentences of Peter Lombard* (handouts)
What are key elements of the Thomistic synthesis of Christian thought and Aristotelian philosophy, especially on the problem points of tension between the two outlooks?

Th 2/23  Medieval Cosmology
**READ: BWS 254-85**
How did medieval thinkers extend and adapt Platonic-Ptolemaic cosmology? What was the effect on cosmology of the recovery of Aristotelian philosophy? What problems were raised by integrating Aristotelian ideas into the Christian medieval framework, and what solutions did medieval thinkers devise? What tools helped the advance of medieval astronomy, and what specific advances were made? What was the medieval view about the place of the earth in the cosmos? What important proposal was made by Oresme concerning the place of the earth, and what does Lindberg think its effect was?

2/27-3/3  **GIF Spring Break**

M 3/6  Medieval Physics
**READ: BWS286-312**
How did reception of Aristotle affect the medieval view of nature, change, and physical substance? What advances to the science of motion were made by medieval thinkers? What was the concept of impetus and what was it meant to explain?

T 3/7  Was There a Medieval Scientific Revolution?
**READ: BWS351-67**
Michael Tkacz, "Late Medieval Scientific Revolution" (handout)
What advances were made in biology and zoology by medieval thinkers? What is the "continuity issue" in assessing the medieval science? Should we think of medieval science as revolutionary? How do Lindberg and Tkacz compare on this question? What considerations concerning the nature of science and scientific research programs shape our answer to the question of whether the work done by medieval scientists was "revolutionary"?

Th 3/9  Renaissance Science
**READ: Blake, Ducasse, and Madden, "Natural Science in the Renaissance" (handout)**
What groups were competing intellectually by the end of the 1300s (fourteenth century)? Who were the Renaissance humanists, and what influences shaped their thinking? Were they serious competitors to the traditions of natural philosophy / science that had emerged in the high middle ages? What approach to science was taken by Leonardo da Vinci?
M 3/13  Francis Bacon’s New Approach to Science
READ: Bacon, 1-17
For detailed reading questions on Bacon, see Dr. Kries’ questions (Blackboard)
What, according to Bacon, is the state of the sciences in the early 1600s? What reasons have caused this state of affairs, and what does Bacon think must be done to rectify it? What view of science does Bacon seem to have?

T 3/14  Bacon’s Vision of a Scientific Culture: The New Atlantis
READ: Bacon, 37-60
For detailed reading questions on Bacon, see Dr. Kries’ questions (Blackboard)
What is the story about? What do we know about the narrator and the events that bring the boat and sailors to the mysterious island, which we come to find is called ïBensalemï? How are the sailors treated? What officials meet with them, and what are they told about the island? What events at Renfusa led the inhabitants of the island to embrace Christianity? What should we think about how this occurs? What are the rules about travel to and from Bensalem, and why do they exist as they do? What is Salomonï’s House, how was it established, and for what purpose does it exist?

Th 3/16  Bacon’s Vision of a Scientific Culture: The New Atlantis
READ: Bacon, 60-83
For detailed reading questions on Bacon, see Dr. Kries’ questions (Blackboard)
What is the Feast of the Family? What does it celebrate, and how is the celebration conducted? What Jew of Bensalem does the narrator meet, and what does this person tell him about the customs of Bensalem? What is the point of the Adamï and Eveï pools? What does the narrator learn from the Father of Salomonï’s House? In general, what seems important in Bensalem, and how is the island truly governed? What do you think Bacon means to communicate by this ïfablï?

M 3/20  Galileo: Renaissance science and the challenge of Copernicanism
READ: Galileo 97-102, 8-10, 103-9
reading / study questions coming

T 3/21  Galileo: Renaissance science and the challenge of Copernicanism
READ: Galileo 109-45

Th 3/23  Galileo: Renaissance science and the challenge of Copernicanism
READ: Galileo 146-67

M 3/27  Galileo: Renaissance science and the challenge of Copernicanism
READ: Galileo 170-78, 190-222

T 3/28  Galileo: Renaissance science and the challenge of Copernicanism
READ: Galileo 233-50, 272-94

Argumentative paper due at the beginning of class

Th 3/30  tour visit to Galileo Museum (details TBA)

M 4/3  Descartes and early modern philosophy & science
READ: Discourse parts I, II, V
What view of the cosmos does Descartes have? What view of nature and of human beings? In what ways does Descartes think that his views are ïscientificï? What view of the Galileo episode does Descartes have, and what effect did it have on him?

T 4/4  DISPUTATION: On balance, did medieval Christianity impede or promote the development of early modern natural science?
READ: Rodney C. Stark, ïGodïs Handiwork: The Religious Origins of Scienceï
Noah J. Ephron, ïMyth 9: That Christianity Gave Birth to Scienceï
What is Starkï’s view of the supposed ïwarï between Christianity and science in the late medieval and early modern period? To what extent was the Copernican /
Galilean revolution truly revolutionary? What evidence does Ephron offer to critique Stark's claims? How do some of the particular episodes and figures of this period and following support or fail to support the thesis that Christianity and science are opposed?

**Disputation summary due at the beginning of class (bring 2 copies to class)**

Th 4/6 Course conclusion; possible reading TBA