HON 367                                            Interterm  2014
Pythagoras Revisited: A Quest for Interior Precision

Catalog Description:
Prerequisite: acceptance to the University Honors Program, or consent of instructor. Can precision and quantitative reasoning be integral parts of spirituality and introspection? How do we express a contemplative experience that does not renounce to exacting discrimination of inner and outer phenomena? In this course we will move at the intersection of mathematics, literature, philosophy and religion, to find possible answers to these questions. (Offered as needed.) 3 credits.

Course Learning Outcomes:
By the end of this course, students will have:
• Obtained an interwoven understanding of key philosophical, mathematical and religious concepts, as well as a broad exposure to fundamental thinkers from disparate religious and philosophical traditions.
• Developed the ability to rigorously and creatively discuss and write about the significance of mathematics in introspective and religious thought, mediated by extensive readings of relevant primary texts and secondary literature.
• Sharpened their research skills through an understanding of the psychological process of scientific discovery.

Honors Program Learning Outcomes:
Upon completing a course in the University Honors Program students will have:
a. Obtained a starting point for integrative exploration of the development of cultures and intellectual achievements through a variety of disciplinary and interdisciplinary perspectives;
b. Sharpened their ability to critically analyze and synthesize a broad range of knowledge through the study of primary texts and through engagement in active learning with fellow students, faculty, and texts (broadly understood);
c. Understood how to apply more integrative and interdisciplinary forms of understanding in the advancement of knowledge and in addressing complex challenges shaping the world;
d. Developed effective communication skills, specifically in the areas of written and oral exposition and analysis.
Content:

The course will start from a careful reading of relevant passages of the books and notebooks of Simone Weil, a thinker of our time that meditated deeply on the role of mathematics in spiritual matters. Through her writings, we will reach back to authors such as Plato, and the pre-Socratic thinkers, but also hear other views on mathematics and spirit, as those of Blaise Pascal and Robert Musil.

Philosophers and mystics from disparate religious traditions, such as Ibn Arabi, Dogen, and Abhinavagupta, expounded profound views on (the perception of) time, space and logical, quantitative reasoning. In their writings we will explore how far can our intellect be stretched when dealing with things that are so concealed (i.e. mystical) that they are fully manifest and therefore not amenable to our usual forms of language.

We will also introduce mathematical ideas that most powerfully convey the sense of wonder and contemplation peculiar to mathematics. Examples will include proofs of irrationality of numbers, projective, real and non-Euclidean geometries, complex numbers and complex analysis, transfinite numbers, incompleteness theorems, etc. The focus will always be on understanding, and developing an appreciation for, the fundamental ideas, rather than on becoming technically competent in solving problems.

Finally, we will look at the essays of those mathematicians, Henri Poincare, Jacques Hadamard, André Weil and others, that tried to understand the dynamics of scientific discovery through inner analysis of their thought processes.

Current Required Texts:

Required texts are:


A variety of texts will be in reserve at the library. Whenever available, I will point out online access to the primary texts and the secondary literature discussed in the course.

Mathematics and Science:

- *Proofs from the book* by Martin Aigner and Günter Ziegler
- *The Road to Reality* by Roger Penrose

Literature, philosophy, spirituality:
Psychology of scientific discovery:

- *Science and Hypothesis* by Henri Poincare
- *The apprenticeship of a mathematician* by André Weil

**Instructional strategies:**

The course will include daily, in-depth discussions, based on pre-assigned readings and introduced by lectures that will set the stage for the topics. Each student will lead and moderate at least one discussion.

Students will write an extensive and rigorously argued analysis of a specific topic, or text. The topic of this final paper will be individually assigned by the instructor, during the first week, on the basis of each student interests.

**Methods of Evaluation:**

Assessment of student performance will be based on the following items:

1. **In-class discussions (30% of the grade).** Each student is expected to be directly involved in the discussion, during each meeting. Because of this, daily attendance is required.
2. **Discussion moderation (20% of the grade).** Students will be assessed based on their grasp of the topic at hand; the creativity used in framing the topic and linking it with other discussions; the ease and effectiveness of their moderation.
3. **Final paper (50% of the grade).** Every week, students are expected to share with the instructor the current draft of their paper, and be prepared to explain in class their current thinking. Papers should not only be detailed reviews of existing work, they should also offer a synthesis, and an original viewpoint, on the chosen topic.

**Chapman University Academic Integrity Policy:**
The course syllabus should include the following statement:
Chapman University is a community of scholars which emphasizes the mutual responsibility of all members to seek knowledge honestly and in good faith. Students are
responsible for doing their own work, and academic dishonesty of any kind will not be tolerated anywhere in the university

**Students with Disabilities Policy:**
The course syllabus should include the following statement:
In compliance with ADA guidelines, students who have any condition, either permanent or temporary, that might affect their ability to perform in this class are encouraged to inform the instructor at the beginning of the term. The University, through the Center for Academic Success, will work with the appropriate faculty member who is asked to provide the accommodations for a student in determining what accommodations are suitable based on the documentation and the individual student needs. The granting of any accommodation will not be retroactive and cannot jeopardize the academic standards or integrity of the course.

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**Prepared by: Domenico Napoletani**

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