

Integrative Studies 2: Nature and Creation of Mathematics

In Integrative Studies 2 we explore the nature and foundations of logic and mathematics. Western culture has long considered these sciences to be the most certain of them all. We learn early in life that mathematical calculations are right or wrong, true or false, with little or no gray area. Is this view correct? How do we know? These are among the sorts of questions we will think about in Integrative Studies 2.

Table of Contents

The contents of this syllabus are as follows:

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Texts

Required

The following works are required:

Aristotle, *Posterior Analytics*
Descartes, *Discourse on the Method*
Einstein, *Relativity*
Euclid, *Elements*, Book I
Lobachevsky, “Theory of Parallels”
Nagel and Newman, *Godel’s Proof*
Shimer College staff papers: “A Little Reasoning about Reasoning and Logic,” “Bits and Bins,” and “On Paradox”

Course Readings

A list of the books and articles used in this course follows in the order in which they are read. Additional assignments will be announced in class.

“Bits and Bins”
“A Little Reasoning about Reasoning and Logic”
Euclid, *Elements*, Book 1

Aristotle, *Posterior Analytics*
Lobachevsky, "Theory of Parallels"
Descartes, *Discourse on the Method*
Einstein, *Relativity*
"On Paradox"
Nagel and Newman, *Godel's Proof*

Course Requirements

Discussion (50 percent)

A good discussion depends upon careful preparation, willingness to speak and listen, open-mindedness, and mutual respect. Each student is expected to attend every class meeting on time. This is especially important given that we will be deciding the assignment for each class at the end of the previous class (the course syllabus below is approximate). You are subject to being dropped from the course if you are absent more than four times, with late appearances counting as partial absences.

Journal (25 percent)

You must keep a journal in which you make entries for each work we study. These journals should include homework assignments, reading and study notes, and other reflections on the class material. To help with the latter, I am distributing a list of questions, some of which you may choose to address in your journal. I will collect the journals periodically.

Final Examination (25 percent)

A final exam will be given at the end of the semester. A practice midterm, given at mid-semester, should help prepare you for the final.

Syllabus

January 31	"Bits and Bins"
February 3–7	"Bits and Bins" "A Little Reasoning about Reasoning and Logic"
February 10–14	"A Little Reasoning about Reasoning and Logic"
February 17–21	Euclid, <i>Elements</i> , Book I
February 24–28	Euclid, <i>Elements</i> , Book I Aristotle, <i>Posterior Analytics</i>
March 3–4	Aristotle, <i>Posterior Analytics</i>
DEAN'S BREAK	

March 10–14	Lobachevsky, “Theory of Parallels”
March 17–21	Descartes, <i>Discourse on the Method, Rules for the Direction of the Mind</i>
March 24–28	MIDTERM EXAMINATION (non-graded) Einstein, <i>Relativity</i>
March 31–April 4	Einstein, <i>Relativity</i>
April 7–11	“Bits and Bins” “On Paradox”
April 14–15	Review
EASTER BREAK	
April 25	Nagel and Newman, <i>Godel’s Proof</i>
April 28–May 2	Nagel and Newman, <i>Godel’s Proof</i>
May 5–9	Nagel and Newman, <i>Godel’s Proof</i> FINAL EXAMINATION