MALS
Regarding M547: Light

I want to provide information on my course, Mathematics 547, scheduled for the coming fall. To that end, I enclose the current plan and the schedule of meetings.

Mathematics 547: Light **Fall, 2017**

The object of this course is to study the nature and properties of Light, at the interface between Art and Science. We require no special preparation, but we presume interdisciplinary curiosity.

The form of the course shall be flexible: adaptable, as it develops, to the interests of students. In any case, we expect to focus upon the following topics:

(01) The method of Linear Perspective
(02) Geometric Optics: Propagation, Reflection, Refraction and Dispersion of Light
(03) The explanation of the Rainbow, in the works of Descartes and Newton
(04) Optical Instruments: Mirrors, Lenses, the Projector
(05) Outer Light: the production of Light
(06) The Eye: a neural primer
(07) Inner Light: the perception of Light
(08) Colour Space: The Chromaticity Diagram
(09) Colour Synthesis: Edwin Land
(10) "Do not all charms fly at the mere touch of cold philosophy?" Keats, Lamia, II, 229

For references, we shall rely upon the following workshop essays:

(01) Perspective Drawing, TW ($\star$)
(02) Geometric Optics, TW ($\star$)
(03) Rainbow, TW ($\star$)
(04) Chromaticity Coordinates, TW ($\star$)

and the following texts, among others:

(01) Samuel Edgerton, The Renaissance Rediscovery of Linear Perspective ($\bullet$)
(02) Leon Battista Alberti, On Painting ($\bullet$)
(03) Michael Baxandall, Painting and Experience in Fifteenth Century Italy ($\circ$)
(04) Carl Boyer, The Rainbow: from Myth to Mathematics ($\circ$)
(05) David L. MacAdam, Sources of Color Science ($\circ$)
(06) Arthur Zajonc, Catching the Light ($\bullet$)
(07) Margaret Livingstone, Vision and Art ($\bullet$)
(08) Trevor Lamb, Colour: Art and Science ($\bullet$)
(09) Hazel Rossotti, Colour: Why the World Isn't Grey ($\bullet$)
(10) Simon Ings, A Natural History of Seeing ($\bullet$)
(11) Edwin Land, Experiments in Colour Vision ($\star$)
(12) David Falk, Seeing the Light ($\circ$)

The symbol (•) marks essential texts; the symbol (◦) points to useful supplements. The essays marked (⋆) are available, with others, on my website. The last reference (by David Falk) provides a systematic study of our subject, with many simple experiments. However, it is no longer in print and used copies are hard to find.

We will supplement the weekly reading assignments with projects and challenges, for instance, to make a perspective drawing of a house and to explain the corner cube reflector. At the end of the semester, we will expect a (roughly) twenty page paper. The topic shall be developed by the student during the semester, in consultation with me.

We will meet in Eliot 419 on Tuesday evenings from 7:00 PM to 8:30 PM, beginning 08/29, continuing through 12/5. Such a schedule calls for fourteen meetings, one too many. In fact, we will not meet on 9/26, as I will be in Utah. We have the classroom from 6:30 PM to 9:00 PM. I will be present for discussions, during the additional time.

The ASSIGNMENT for the first class (8/29) is to read the book by (the art historian) Samuel Edgerton, concentrating especially on Edgerton's discussion of Alberti's workshop method for perspective drawing (Chapter III: Alberti's Florence). What a beautiful book. The assignment for the two week interval from 9/19 to 10/3 is to read the book by (the physicist) Arthur Zajonc, concentrating on the distinction between outer and inner light. What a strange, unusual book.

There are ten copies of Edgerton's book in the Reed Library. In general, you should acquire the relevant texts through Powell's or Amazon. My essays on Perspective Drawing, Geometric Optics, and the Rainbow will be available soon, on my website:

http://people.reed.edu/%7ewieting

Thomas Wieting
Professor Emeritus
Department of Mathematics
Eliot 408