Study in Venice  

Instructor: Hugh Nelson Howards  
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Informational meeting: I will be holding an informational meeting Tuesday August 31 in West (Calloway) 020. I hope you can make it!

Courses: Each student will take four course. Two will be taught by professors from Venice, including one art history course (which counts as a divisional) and one Italian class. All students must have completed either Italian 113 or Italian 112 prior to going to Venice, but are welcome to have completed more. The students will also take two courses taught by Professor Howards. These courses are described below. More extensive descriptions of the courses are available at my web site listed above.

The Cuisine of Italy: from the farm to the tabletop:

Perhaps nothing is more central to the Italian identity than food. We will take an interdisciplinary look at food in Italy. Among other aspects we will study the science, economics, history, culture and art of Italian cuisine. Below we list some of the categories into which the course can be broken down, naturally all the sections overlap and none can be self contained.

We will look into the effect of the European Union on the cuisine of Italy? We will examine economics, politics, and History of food. How has food in Italy changed over the years. How does food change from one part of the country to another? How does class affect the food people eat and buy? How have people used food and drink to survive and even thrive over time?

Another section will examine science and technology on the farm and in the kitchen how has technology changed the structures of farms in Italy? Has the family farm survived? If so can it continue to survive in the future? We will explore certain scientific principles that remain constant in the production of food, but also ask how technology has changed the way people cook. What is the role of science in the kitchen? Why can you stick your hand into a 400-degree oven without burning it, but not into boiling water (which is almost 200 degrees cooler)? Why do cookbooks often tell you to you to store the bowl and beaters in the freezer before whipping cream, but yet tell you to store them at room temperature before beating egg whites?

The mathematics of the art, architecture, and music of Italy and Europe:

Art, architecture, and music are integrally tied to the field of mathematics. Leonardo Davinci once wrote Non mi legga chi non e matematico or roughly translated, Let no one read me who is not a mathematician. He was an enthusiastic mathematician and artist and recognized the ties between the fields. His mastery of the mathematical notion of perspective was one of the things that distinguished his work and left his legacy. Other mathematical themes in art, include symmetry, tilings and tessellations, the geometries of MC Escher,Proportion and the golden mean. This golden mean is quite famous and is rumored to appear in architecture throughout history. The most aesthetically pleasing rectangles are said to have sides whose ratio is the golden mean.
Mathematics in recent art. Some mathematical objects have been turned into art themselves. Dalis The Crucifixion is subtitled Corpus Hypercubicus. In it he has Christ crucified not on a cross, but on a two dimensional image of an unfolded four dimensional hypercube. What is a hypercube? Fractals are one example of math becoming art in its own right. Studies have even been done on Jackson Pollacks paintings that determine the fractal dimension of Pollacks paintings and demonstrating a strong correlation of this dimension to aesthetic rankings of the paintings formed by polling the public.

Soap bubbles form mathematically sophisticated shapes called minimal surfaces. Sculptors have tried to capture the elegance of such surfaces in various forms. Finally, award winning artist Helaman Ferguson, a contemporary sculptor has created what he calls theorems in stone in which his sculptures serve the dual purposes of art and demonstrating proof of a mathematical theorem.

Mathematics in Music: at the end of the course we will explore mathematical themes in music. Again the field is rich. The rhythm and the beat are mathematical structures. We will use mathematics to compose our own. Other concepts that we will explore that blend mathematics and music include harmonic motion, vibrating strings, damped harmonic motion, the wave equation for strings, consonance and dissonance, scales, Fourier transforms, amplitude and frequency modulation, and of course, the elementary question what is sound? We will see themes reappear here, such as the Fibonacci numbers.

This course counts for a divisional credit in mathematics. No mathematical background is necessary. Another version will be available for more advanced mathematical students (such as math majors, math minors, and cs majors).

**Application:** The application is due September 30, 2004. All applicants will also schedule a short interview with Professor Howards. The application is available through my web site listed above.

**Contacting Professor Howards:** To contact professor howards please call him at x5352 or send him an email at his email address listed above. If you do send an email please use "Venice" as the first word in the subject line so that I will be certain to get it even if the spam filter tries to delete it! I hope you will apply!!!!!