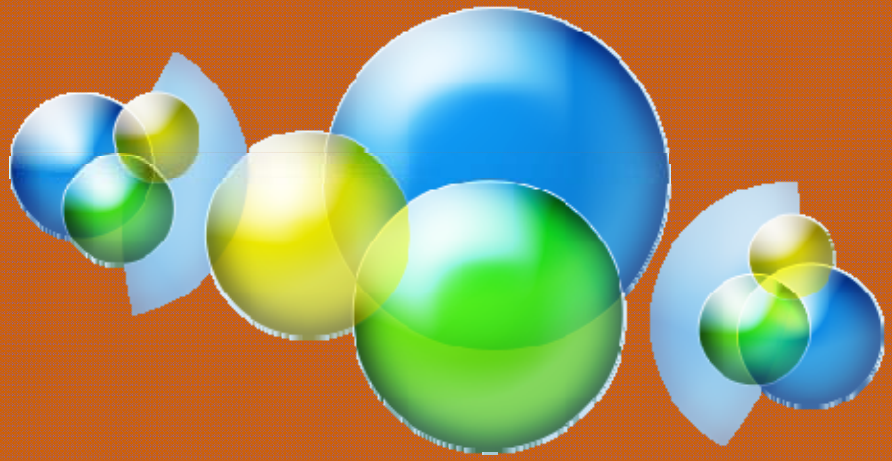
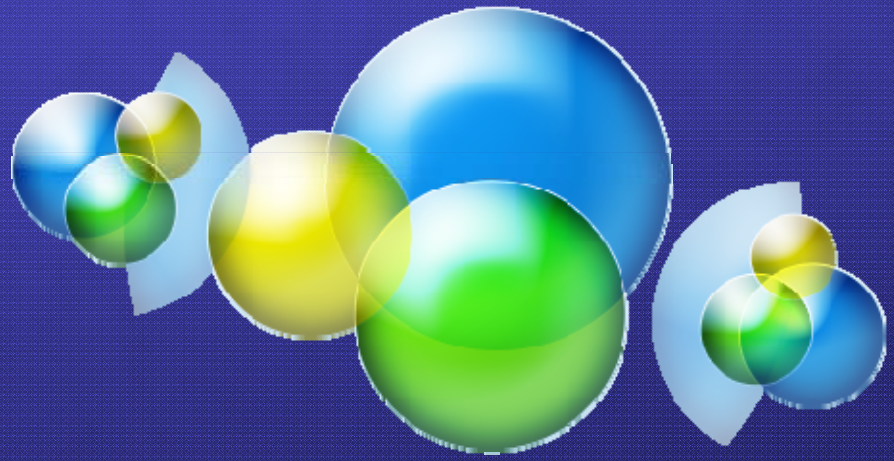


ASPIRE

Quantitative Literacy, Historical, Women's, and Gender Studies Courses at the University of Texas at Austin

Van Herd
University of Texas at Austin
Joint Mathematics Meeting
13 January 2015



WOMEN'S AND GENDER STUDIES

QUANTITATIVE EPISTEMOLOGICAL FOUNDATIONS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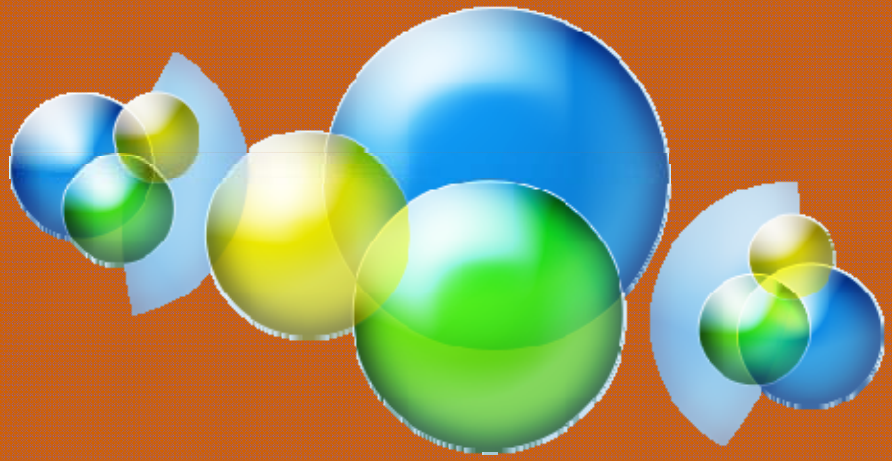


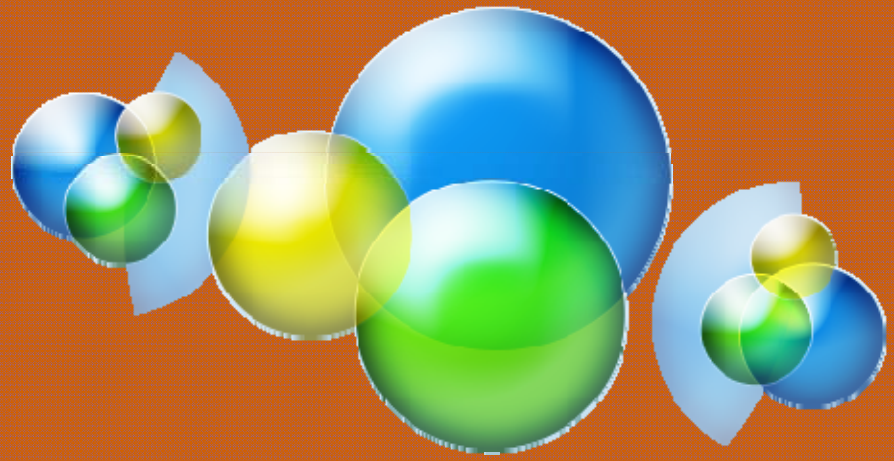
QUANTITATIVE REASONING

Question 1

Please describe specifically the quantitative skills students will learn and apply in the course.

Responses should clearly identify the quantitative skills or models that students will learn in your course. Here is a sample response, submitted by a faculty member from the McCombs School of Business:

Information and Analysis (MKT 460) introduces students to the process of marketing research: converting data to information to insights to decisions. Students are exposed to conceptual and theoretical aspects of research, including primary survey research, market data, experimental research, and response modeling. Real-world data sets and problems motivate the learning experience, and help encourage critical thinking and develop quantitative tools that students can apply to marketing decisions in their future careers.



QUANTITATIVE REASONING

Question 2

On what kinds of real-world problems will students use quantitative skills?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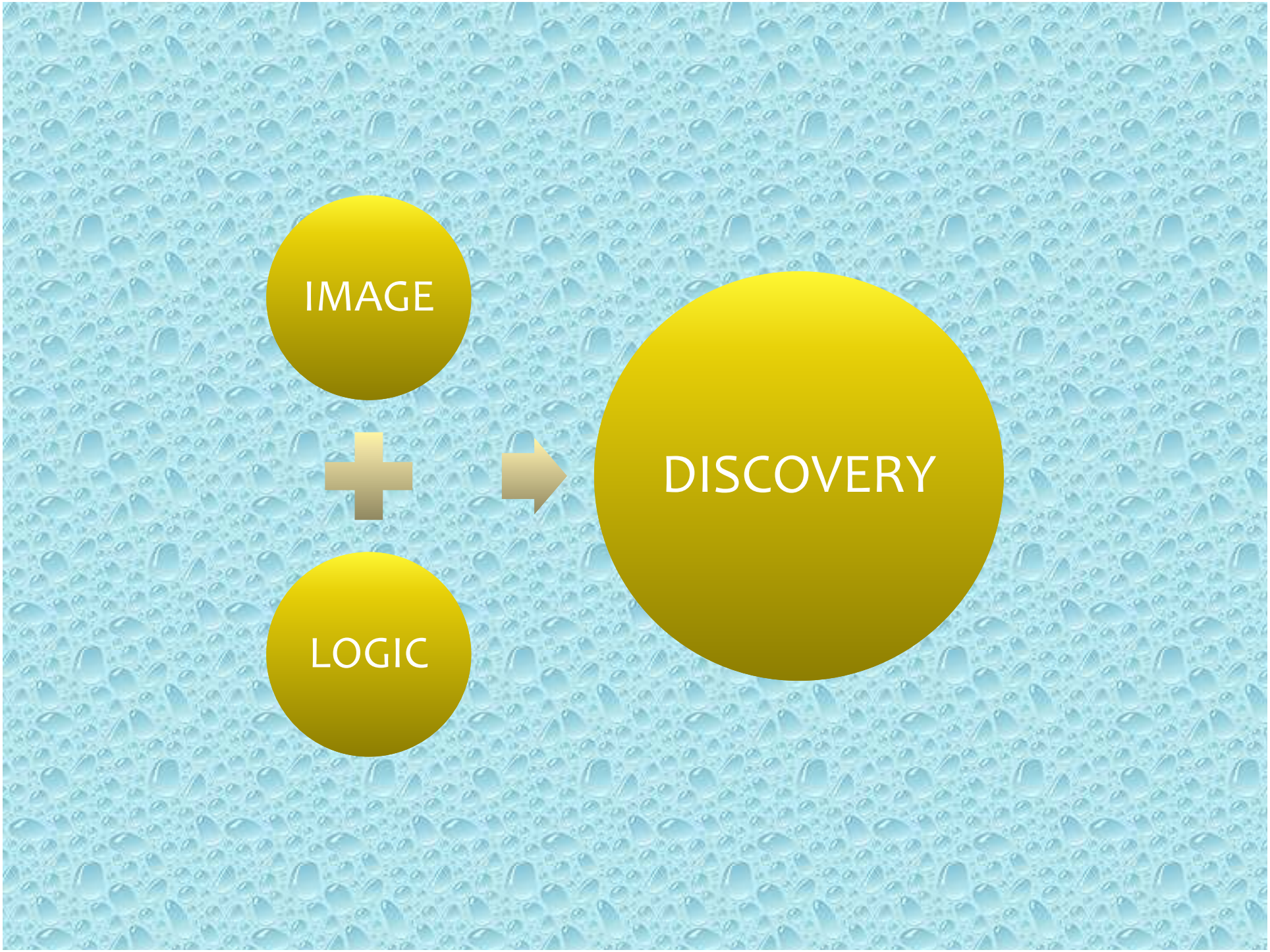
IMAGE
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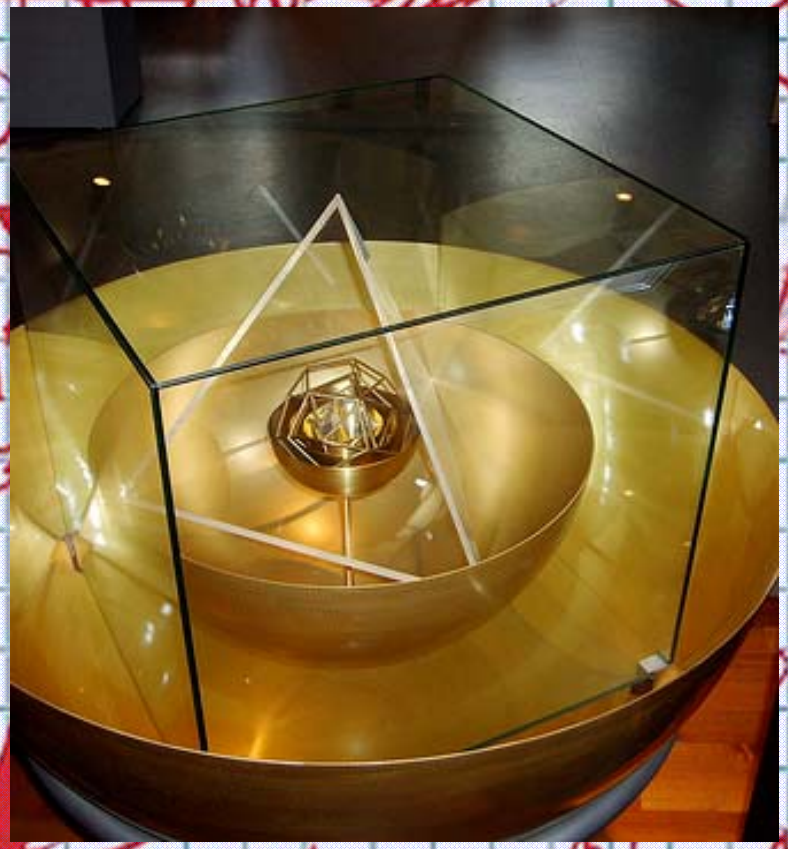
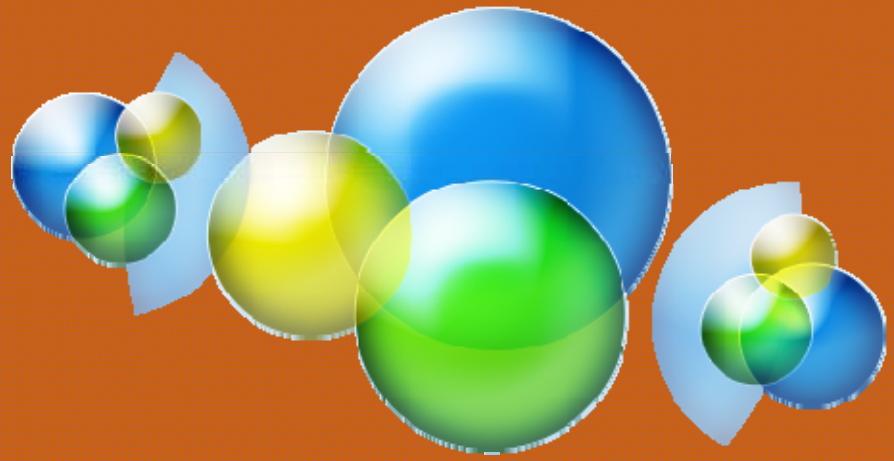
FOUR (4) ACTIVITIES



- (RE)DISCOVERY
- PAPER
- GROUP WORK
- ENRICHMENT

When answering this question, be sure you make clear to faculty outside of your discipline the types of problems your students will attempt to solve through quantitative analysis. A faculty member in the College of Natural Sciences submitted the following description:

Students will be exposed daily to studies and real data sets concerning health, behavior, and scientific/technological discoveries. Topic possibilities include, but are not limited to, DNA evidence in the course, success rates for artificial reproductive technologies as a function of age, factors influencing costs of medical treatment and length of stay, and trends in international quality of life indicators.



QUANTITATIVE REASONING

Question 3

Describe typical assignments related to Quantitative Reasoning.

GENDER

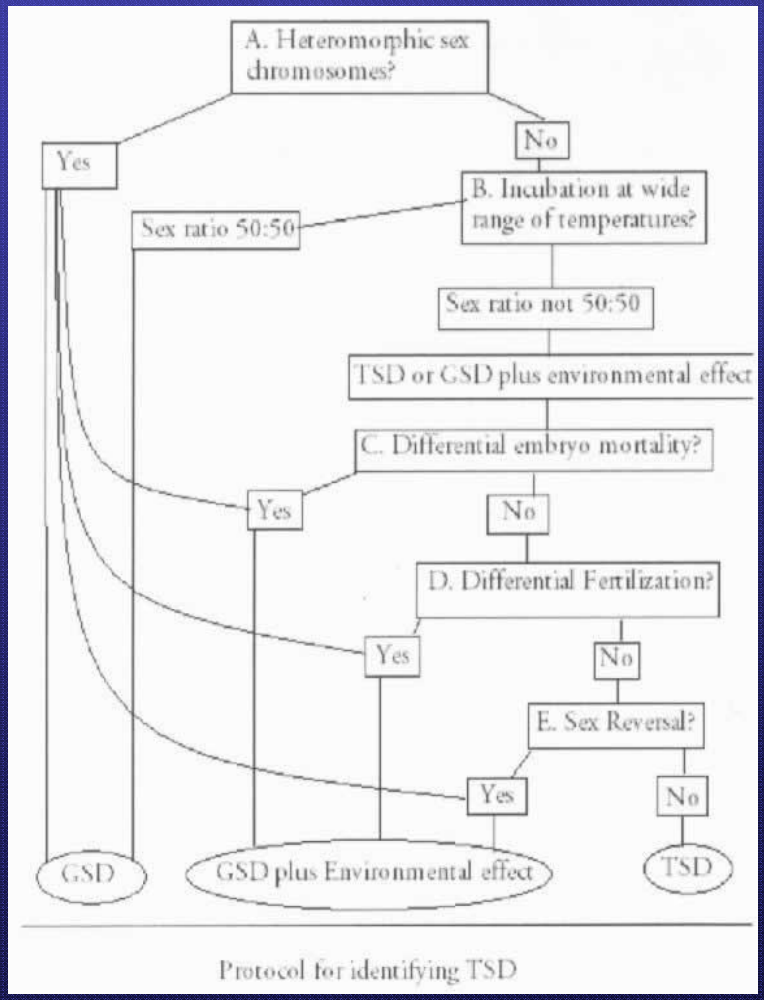
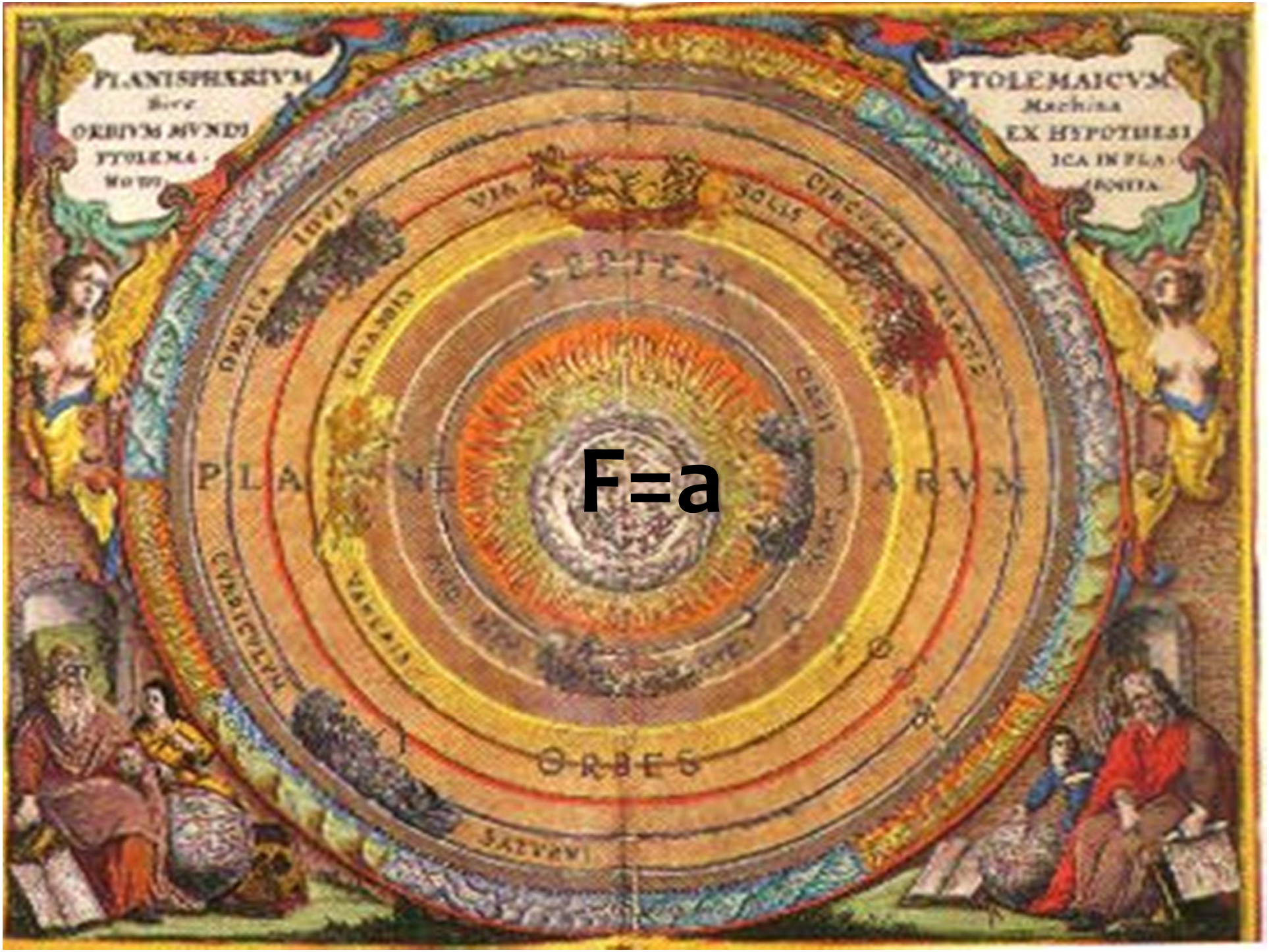


Figure adapted from: Valenzuela, Nicole, Dean C. Adams, and Frederic J. Janzen. "Pattern Does Not Equal Process: Exactly When is Sex Environmentally Determined?" *The American Naturalist* 161.4 (2003).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EARLY MODERN: GALILEO

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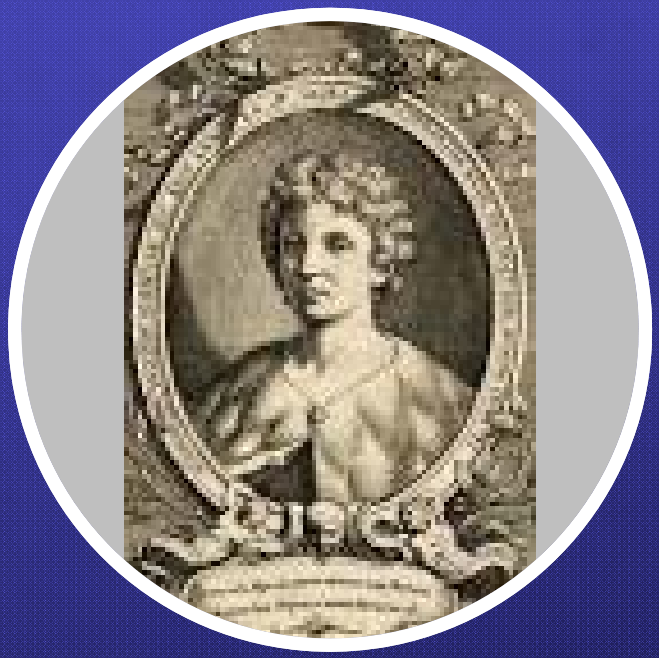
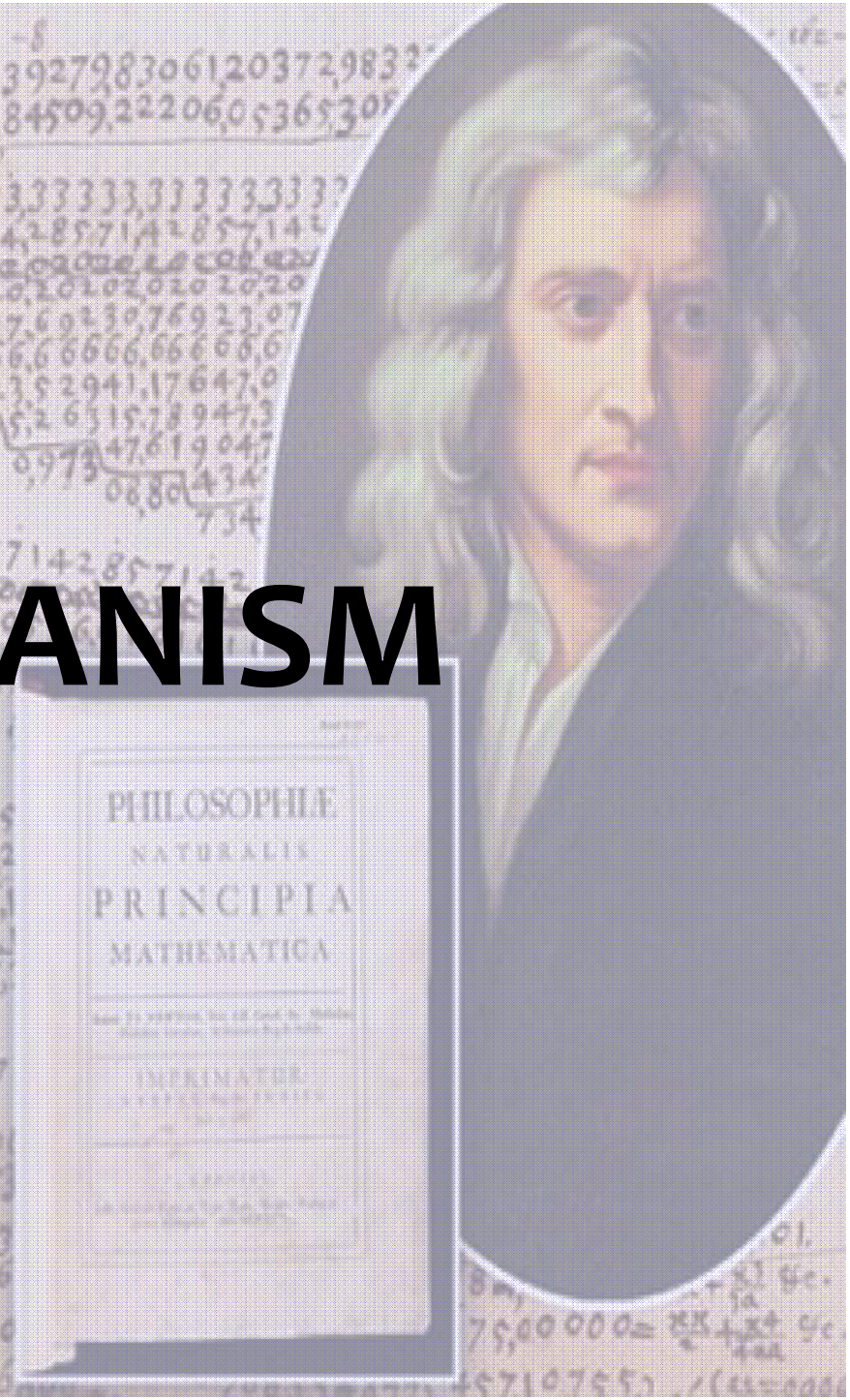


LAURA BASSI

University of Bologna

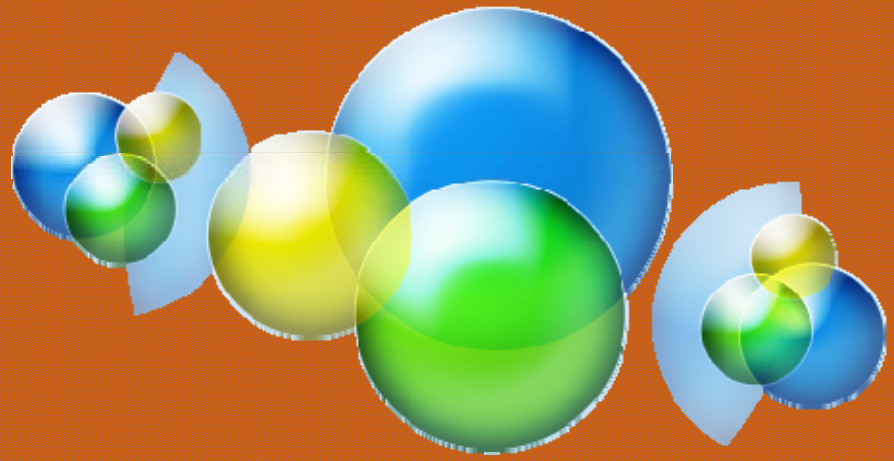
1711-1778

NEWTONIANISM



Use your answer to illustrate how quantitative analysis figures into the graded work your students are asked to complete. A faculty member in the Jackson School of Geosciences describes typical course assignments as follows:

A typical recitation assignment will be to solve for all of the major carbonate species concentrations in Barton Springs given only the pH and an assumption of equilibrium with limestone. This involves several different equations, and most important, several critical assumptions to simplify the system. The students then check their answers against the geochemical model output for the same system, and evaluate where the potential errors are. The final project for the course is an in-depth evaluation of the geochemical evolution of groundwater in a specific aquifer in Texas. The students work on this project throughout the semester, and each recitation session has aspects that are applied to the project.



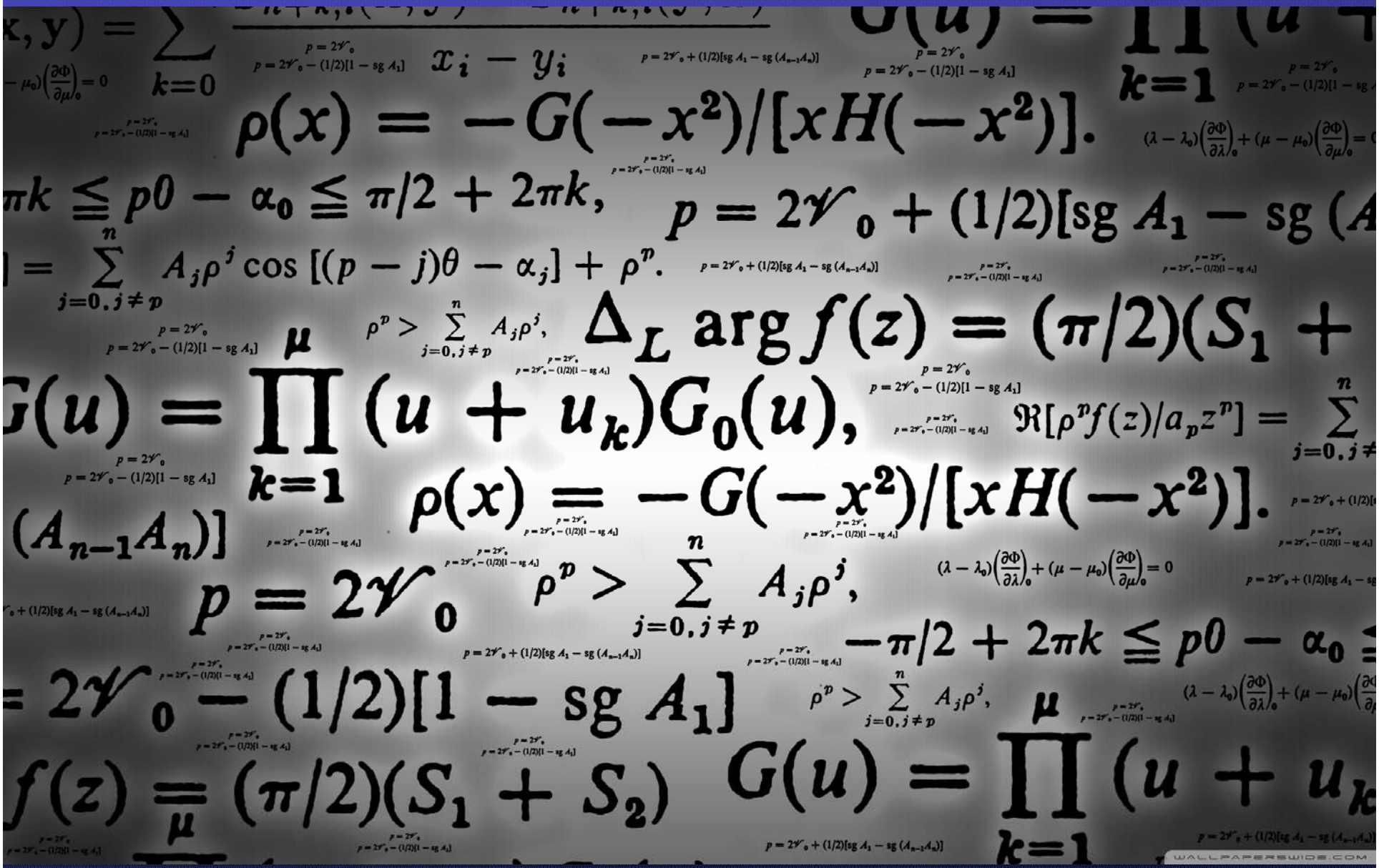
QUANTITATIVE REASONING

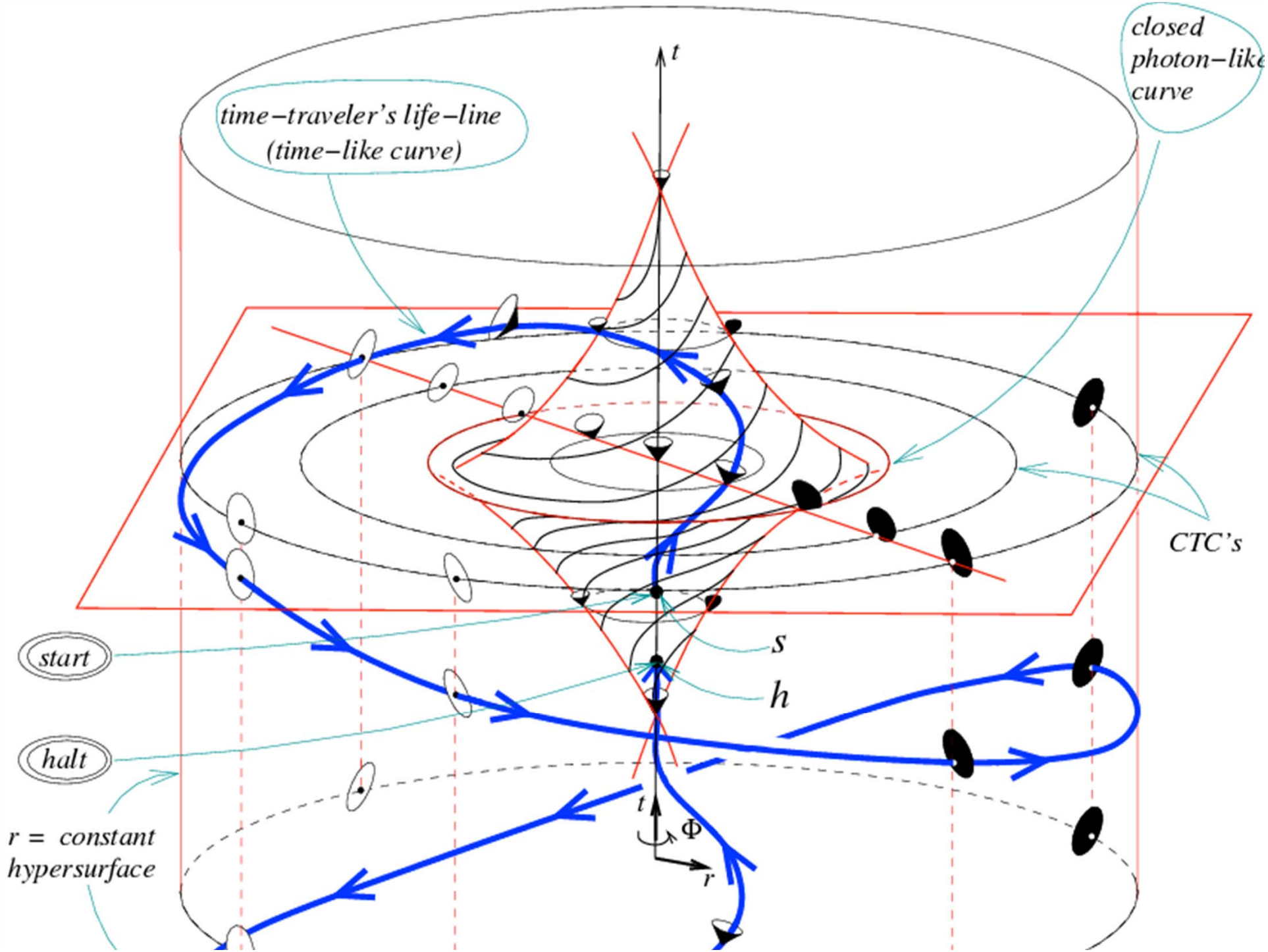
Question 4

Please explain how at least one-half of the course grade is based on content related to Quantitative Reasoning.

It is helpful for the faculty flag committee to see how grading breaks down for your course since the percentage of graded content is an explicit part of the criteria. The following example was submitted by a faculty member in the College of Education:

As noted in the attached syllabus, the course is graded based on a total of 600 points. Examinations (sample attached) count for 450 points, and 40-50% of the exam grades (180 points) are based on problem solving (note that much of the rest of the exam questions require quantitative reasoning, but not actual computation). Written lab reports, worth 120 points, are graded based on the student's reporting and analysis of their data (sample lab assignment attached).


$\rho(x) = -G(-x^2)/[xH(-x^2)].$
$\pi k \leqq p0 - \alpha_0 \leqq \pi/2 + 2\pi k,$
$p = 2\mathscr{V}_0 + (1/2)[\operatorname{sg} A_1 - \operatorname{sg} (A$
$= \sum_{j=0, j \neq p}^{n} A_j \rho^j \cos [(p-j)\theta - \alpha_j] + \rho^p.$
$\rho^p > \sum_{j=0, j \neq p}^{n} A_j \rho^j,$
$\Delta_L \arg f(z) = (\pi/2)(S_1 +$
$G(u) = \prod_{k=1}^{\mu} (u + u_k) G_0(u),$
$\Re[\rho^p f(z)/a_p z^p] = \sum_{j=0, j \neq$
$(A_{n-1}A_n)]$
$p = 2\mathscr{V}_0$
$\rho^p > \sum_{j=0, j \neq p}^{n} A_j \rho^j,$
$(\lambda - \lambda_0)\left(\frac{\partial \Phi}{\partial \lambda}\right)_0 + (\mu - \mu_0)\left(\frac{\partial \Phi}{\partial \mu}\right)_0 = 0$
$-\pi/2 + 2\pi k \leqq p0 - \alpha_0 \leqq$
$= 2\mathscr{V}_0 - (1/2)[1 - \operatorname{sg} A_1]$
$\rho^p > \sum_{j=0, j \neq p}^{n} A_j \rho^j,$
$f(z) = (\pi/2)(S_1 + S_2)$
$G(u) = \prod_{k=1}^{\mu} (u + u_k$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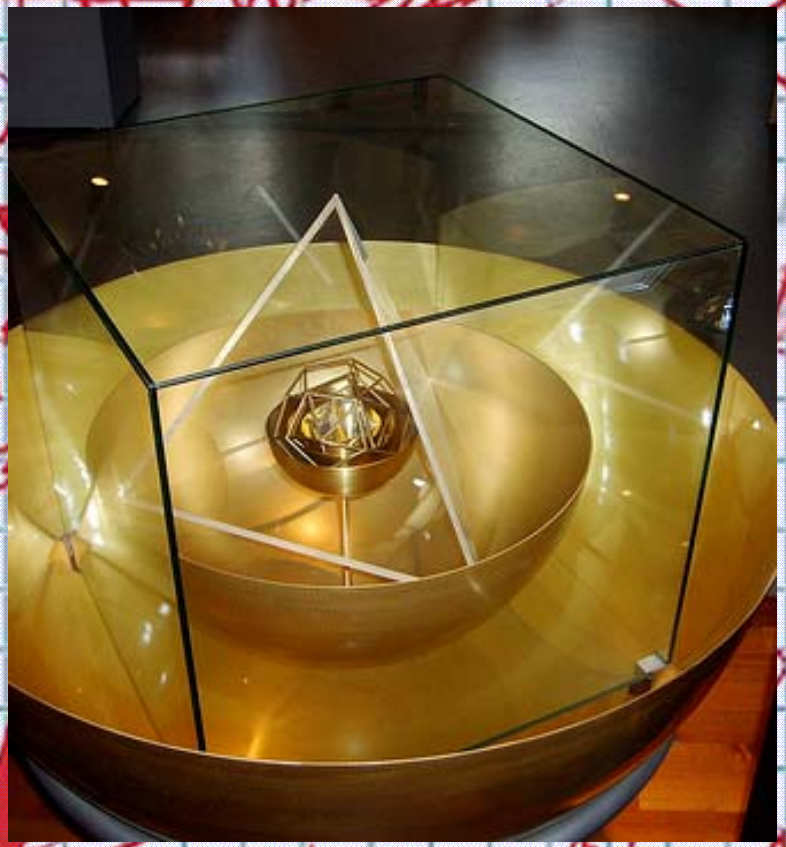


1. Please describe specifically the quantitative skills students will learn and apply in the course.

- Descriptive statistics, correlation, & regression (OLS); familiarity with a menu-driven data statistical analysis package like (though presumably not) SPSS.

2. On what kinds of real-world problems will students use quantitative skills?

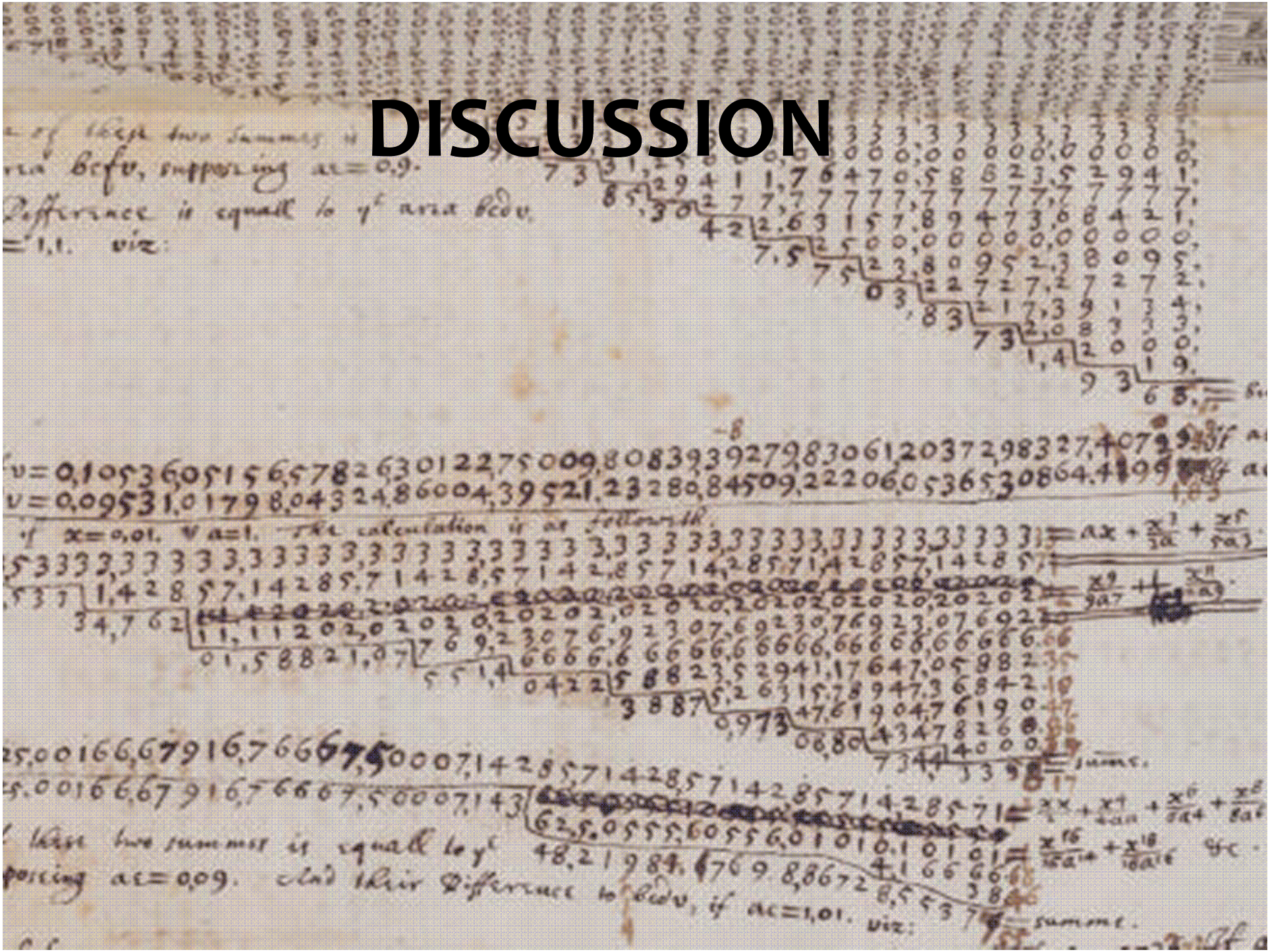
- Explanation of vote choice, voting and other forms of political participation, policy attitudes, party affiliation, and political knowledge, among other things.

3. Describe typical assignments related to Quantitative Reasoning.

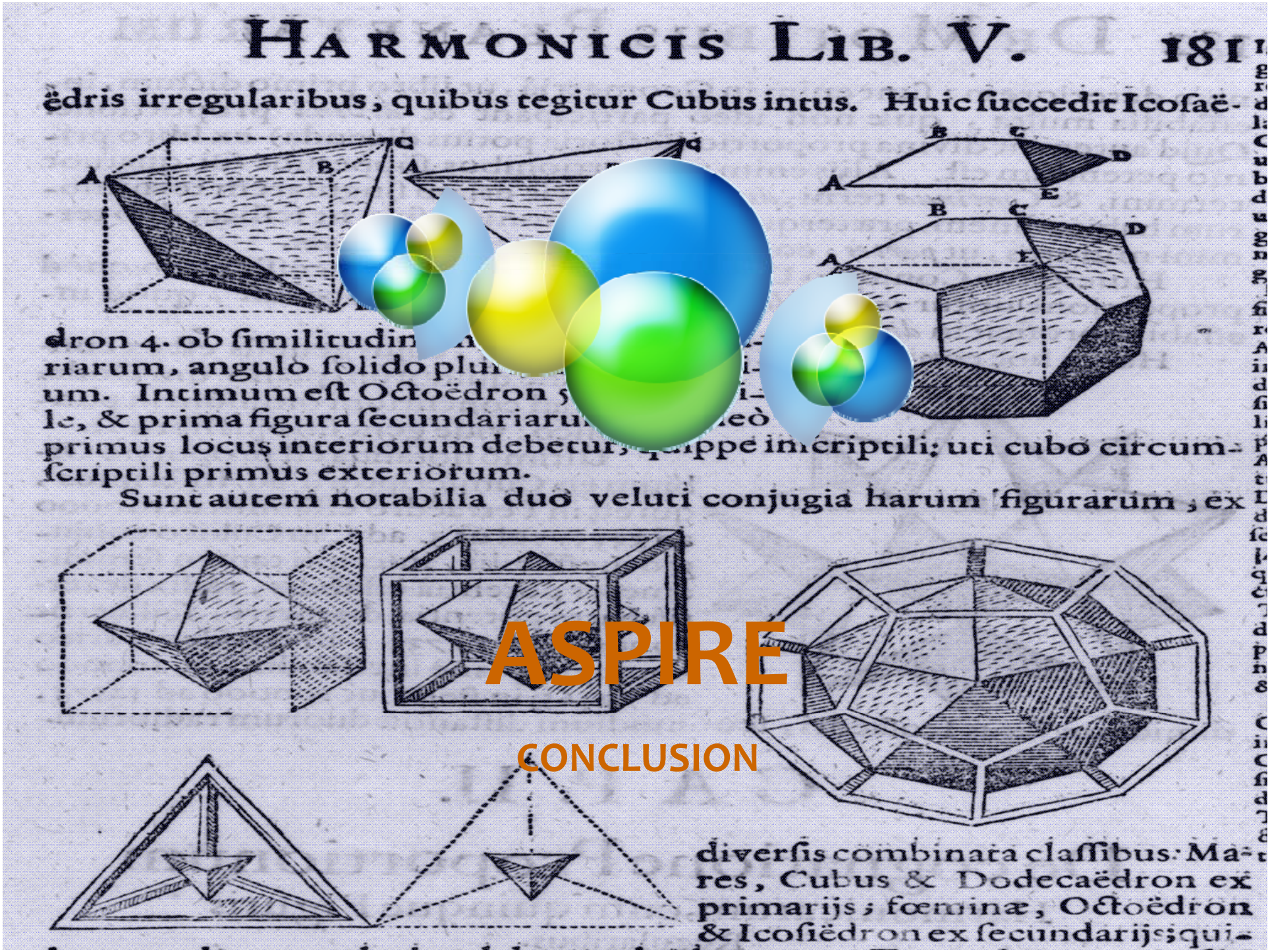
- A 20-30 page term paper developing and testing plausible hypotheses about the effects on some aspect vote choice, voting and other forms of political participation, policy attitudes, party affiliation, or political knowledge, based on data from the American National Election Studies.

4. Please explain how at least one-half of the course grade is based on content related to Quantitative Reasoning.

- The paper will count for 75% of the course grade, and all of that will be related to "quantitative reasoning" –in the development of the hypotheses, the representation of those hypotheses in equations, the estimation of the parameters of those equations (and thus the effects on the dependent variable), and the interpretation of the results.



DISCUSSION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CONTACT

Van Herd

herd@austin.utexas.edu