

HISTORY OF MATHEMATICS – MATH 143

Course Description: This course represents a historical survey of the development of mathematical concepts in algebra, geometry, number theory, analysis, analytical geometry, probability, statistics, and calculus from ancient through modern times. Theorems with historical significance will also be studied as they relate to the development of modern mathematics. This course is also about the people responsible for progress in the mathematics, as well as the social and cultural frameworks animating the many ingenious methods invented to solve a variety of problems. A fundamental goal of this course is to develop in students an appreciation for the contributions of people from various cultures to mathematics, and to empower them with the content knowledge needed for enhancing their teaching in the future with problems and solutions having historical relevance.

Course Outline:

- Arithmetic in various number systems
- Connections between number systems and geometry
- Proofs in mathematics
- Practical mathematics of various cultures such as the Egyptian, Babylonian, Greek, Islamic, Indian, European, and Chinese.
- Methods to solve equations
- Calculus and the mechanical view of the world
- Probability, statistics
- Linear Algebra, groups, fields
- Set theory; paradoxes, topology, vector spaces

Learning Outcomes: *At the completion of the course students will be able to:*

1. Perform basic operations in various number systems.
2. Solve equations using historical techniques.
3. Explain historically relevant concepts and proofs related to high school instruction.
4. Give examples of mathematicians' work from a wide variety of time periods and cultures.
5. Have a better understanding of the origins and development of mathematics encountered in university.
6. Write about epistemological development of mathematical ideas from an historical context.

Prerequisite: Math 75

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Text: Katz, V. (2009) *A History of Mathematics – An Introduction 3rd ed.*, Addison-Wesley.

ASSIGNMENTS AND EXAMINATIONS:

Homework: *Suggested* homework will be assigned every lecture day. The suggested homework serves as the fundamental study guide for the quizzes, midterm, and final. It is imperative to understand the homework and ask questions at the beginning of class or office hours if you are not clear about it. Several homework assignments or select problems may be assigned and collected as part of your group project grade. Assignments such as these will be announced in class and on the course website at least 1 week prior to being due. The homework will be posted on the course website.

Group Projects/Papers: There will be several group project assignments and one individual paper to complete during the semester. A group project may include specifically announced homework assignments

or problems. The Group Projects/Papers credit is collectively worth **20%** of your final grade. Information concerning paper topics and format will be available on course website after MIDTERM 1.

Quizzes: You will have five (5) quizzes during the semester. Each quiz will be worth **3%** of the final grade, for a total of **15%**. You will be asked questions related to previously assigned homework.

Exams: There will be two (2) MIDTERM EXAMS worth **40%** of the final grade, and a COMPREHENSIVE FINAL EXAM worth **25%** of the final grade. The exams principally cover homework-like problems, but may also include information presented in class, and information from readings and activities. Two (2) 8.5X11 sheets of notes, (back and front), may be prepared for the exams.

GRADING SCALE: A: 90 - 100%; B: 80 - 89%; C: 70 - 79%; D: 60 - 69%; F: 0-59%.

RE-SCHEDULING OR MAKE-UP OF QUIZZES AND EXAMS ONLY AVAILABLE WITH DOCTOR'S NOTE OR UNIVERSITY ATHLETIC ACTIVITY DOCUMENTATION – NO EXCEPTIONS.

MATH 143 COURSE OUTLINE
(weekly homework posted on course website outline)

Date	Topic
Jan. 22	Ch.1-Ancient numeration
Jan. 27	Ch. 2-Early Greek mathematics
Jan. 29	Ch. 3- Euclid
Feb. 3	Ch. 4-Archimedes
Feb. 5	Ch. 5-Ptolemy QUIZ 1
Feb.10	Ch. 6-Diophantus;
Feb.12	Ch. 7-Chinese mathematics
Feb. 17	Ch. 8-Indian mathematics
Feb.19	Ch. 9-Islamic mathematics QUIZ 2
Feb.24	Ch. 10-Medieval European mathematics
Feb.26	MIDTERM 1
Mar.3	Ch. 11-Mayan mathematics
Mar.5	Ch. 12-Renaissance Algebra & Cardano
Mar.10	Ch. 13-Kepler & Galileo
Mar.12	Ch. 14-Fermat & Pascal
Mar.17	Ch. 15-Calculus origins QUIZ 3
Mar.19	Ch. 16-Newton & Leibniz
Mar.24	Ch. 17-Euler & Analysis in 18 th century
Mar.26	Ch. 18-Probability & Statistics origins
Mar.31	<i>Cesar Chavez Day-No class</i>
April 2	MIDTERM 2
April 7, 9	<i>SPRING BREAK/ No class</i>
April 14	Ch. 19-Euler & Algebra in 18 th century
April 16	Ch. 20-Clairaut
April 21	Ch. 21- Linear algebra and Groups-Cayley, Sylvester, and Gauss
April 23	Ch. 22-Analysis in 19 th century QUIZ 4
April 28	Ch. 23-Probability & Statistics in 19 th century
April 30	Ch. 24-Geometry in 19 th Century
May 5	Ch. 25-Set theory, Topology, Fields, Vector Spaces QUIZ 5
May 7	Poster Presentations
May 12	Poster Presentations
May 14,15	FACTULY CONSULTATION DAYS HOURS TBA
May 19	FINAL EXAM; Tuesday from 1:15P-3:15P in S2 207

ACADEMIC INTEGRITY HONOR CODE

California State University, Fresno is committed to maintaining a culture of academic integrity where all members are expected to adhere to fundamental values in both academic and non-academic endeavors. For purposes of this code, academic integrity is defined as “a commitment, even in the face of adversity, to five fundamental values: honesty, trust, fairness, respect, and responsibility. From these values flow principles of behavior that enable academic communities to translate ideals to action” (Center for Academic Integrity, *Fundamental Values of Academic Integrity*. <http://academicintegrity.org/fundamental.asp>, accessed January 2005).

The Code

Members of the CSU Fresno academic community adhere to principles of academic integrity and mutual respect while engaged in university work and related activities.

Principles of Implementation

- a. All members of the university community are responsible for adhering to high standards of academic integrity, for actively ensuring that others uphold the Code, and for responding assertively to violations.
- b. Faculty members are responsible for informing students of academic behaviors that are permissible and not permissible, and for reporting violations of the code to the proper campus authorities.
- c. Students shall not give or receive unauthorized aid on examinations or other course work that is to be used by the instructor as the basis of grading.

Responsibilities of CSU Fresno Administration

The CSU Fresno administration will:

- a. Exhibit high standards of professional ethics.
- b. Incorporate ‘orientation/training’ about the university’s expectations for student academic integrity into “Dog Days”, University 1, English 1, History 11 and 12, Political Science 2, and all special group orientations (e.g., EOP, Summer Bridge, AMP, ISSP, SCOP, HCOP, student-athletes, Smittcamp Family Honors College, McNair, etc.).
- c. Provide training on academic integrity expectations and implementation procedures to all levels of academic personnel (i.e., faculty, department chairs, deans, administrators and staff) through:
 - i. orientations for
 - ii. academic policies and procedures, TLT workshops and other faculty development programs
- d. Distribute the Honor Code and related policies widely through office posting and distribution, Internet web sites (including my.csufresno.edu) and university publications and programs.
- e. Support the Office of Student Judicial Affairs in the implementation of academic integrity policies.

Responsibilities of CSU Fresno Faculty

CSU Fresno academic faculty will:

- a. Exhibit high standards of professional ethics.
 - b. Treat all students fairly and consistently to avoid any appearance of special favors for special groups.
 - c. Explain what constitutes cheating, plagiarism, inappropriate collaboration or other issues related to academic integrity through the class syllabus, and in relation to assignments, tests and other class activities for which grades are to be assigned. Provide links to university web sites that explain and elaborate these policies.
 - d. Give examples of cheating and plagiarism for the particular class and provide examples of past consequences to students for such behavior.
 - e. Regularly update tests, assignments and notes.
 - f. Uphold university policy to report all instances of cheating, plagiarism and inappropriate academic behavior to the Office of the Vice-President for Student Affairs /Dean of Students.
 - g. Establish a ‘culture of academic integrity’ in individual classes and in each department.
 - h. Monitor students during tests and develop procedures for assessing whether assigned work has been completed in accordance with expectations.
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j. Develop expectations for student self-monitoring and collective monitoring during examinations and on assignments by having students include and sign the following statement on all work to be used as the basis for a grade: "I have done my own work and have neither given nor received unauthorized assistance on this work."

Responsibilities of CSU Fresno Students

CSU Fresno students will:

- a. Understand or seek clarification about expectations for academic integrity (including no cheating, plagiarism and inappropriate collaboration) as noted by faculty and on class syllabi, university catalogue, university web sites and other referenced sources.
- b. Sign a statement at the end of all exams and assignments that "I have done my own work and have neither given nor received unauthorized assistance on this work."
- c. Take responsibility to monitor academic dishonesty in any form and to report it to the instructor or other appropriate official for action.

Other University Policies:

Students with Disabilities: Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in Madden Library 1049 (278-2811).

Cheating and Plagiarism: "Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one's own work." Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the university. For more information on the University's policy regarding cheating and plagiarism, refer to the [Class Schedule](#) (Policy/Legal Statements) or the [University Catalog](#) (University policies).

Computers: "At California State University, Fresno, computers and communications links to remote resources are recognized as being integral to the education and research experience. In the curriculum and class assignments, students are presumed to have 24-hour access to a computer workstation and the necessary communication links to the University's information resources."

Disruptive Classroom Behavior: "The classroom is a special environment in which students and faculty come together to promote learning and growth. It is essential to this learning environment that respect for the rights of others seeking to learn, respect for the professionalism of the instructor, and the general goals of academic freedom are maintained... Differences of viewpoint or concerns should be expressed in terms which are supportive of the learning process, creating an environment in which students and faculty may learn to reason with clarity and compassion, to share of themselves without losing their identities, and to develop and understanding of the community in which they live . . . Student conduct which disrupts the learning process shall not be tolerated and may lead to disciplinary action and/or removal from class."

In particular, the use in class of cell phones, I-pods, etc. is prohibited.

Copyright policy: Copyright laws and fair use policies protect the rights of those who have produced the material. The copy in this course has been provided for private study, scholarship, or research. Other uses may require permission from the copyright holder. The user of this work is responsible for adhering to copyright law of the U.S. (Title 17, U.S. Code). To help you familiarize yourself with copyright and fair use policies, the University encourages you to visit its [copyright web page](#).

Subject to Change: This syllabus and course schedule are subject to change in the event of extenuating circumstances.
