

MATH 3305: History of Mathematics

Sul Ross State University Rio Grande College

Fall 2022

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Course Description MTH 3305 covers early number systems and symbols, mathematics in early civilizations, and biographies of a representative sample of mathematicians along with an exploration of the chronological development of important ideas in mathematics.

Mathematics Program Outcomes (1) The student will be able to demonstrate content knowledge of basic mathematical principles. (2) The student will be proficient in logic, able to negate statements, provide counterexamples to false statements, and determine the validity of arguments. (3) The student will be able to communicate mathematical content clearly and with valid reasoning.

Marketable Skills (1) Logical and analytical skills. (2) Problem-solving using analytic and algebraic methods. (3) Use of technology in problem-solving and presentation. (4) Communication and pedagogical skills.

Class Meetings Monday and Wednesday, 4:30 – 3:15

Class Location Del Rio 107, Eagle Pass B112, Uvalde B114

Required Text Burton, *The History of Mathematics: An Introduction*, Seventh Edition, ISBN 0073383155

Course Policies

Attendance Policy

Attendance is mandatory. Students are expected to attend class in person in their classroom of registration unless permission is given for extenuating circumstances. You will be held responsible for all material covered in class or in the reading assignments. If you have to miss a class, it is your responsibility to obtain all notes, assignments, and announcements from someone else in the class. Make-up exams will be given only in the event of an emergency, in which case written justification and/or documentation must be provided and approved.

Communication

I will post course documents, reminders, announcements, and assignments on the Blackboard system. You will also submit homework on Blackboard. I may also occasionally send announcements via e-mail. You should make sure you know how to access and use these tools. You are welcome to e-mail, telephone, or text me. However you chose to contact me, please make sure to state your name at the beginning of any message.

You are welcome to stop by my office if you wish to speak about the content or your progress

in the course. Sometimes meetings come up, so it's best to contact me ahead of time if you intend to travel to Uvalde to see me in person.

I am here to help you! Ask questions in class, call me, e-mail me, text me, or come to my office. If you don't communicate with me, then I can't help you.

Grading Policy

Your grades will be weighted as follows:

| | |
|------------------|-----|
| Participation | 10% |
| Weekly Summaries | 30% |
| Exercises | 30% |
| Research Paper | 30% |

A student who averages at least 90% will receive an A; at least 80% will receive at least a B; at least 70% will receive at least a C; at least 60% will receive at least a D.

Participation

Your participation grade will be assigned depending on your class attendance and participation in class activities. Simply put, if you always come to class, seem like you're trying to pay attention and take notes, and take part in class activities, then you will get full credit.

Weekly Summaries

Each week, you will be asked to submit a written summary of the readings for that week. Each summary should be at least 200 words long. You may upload a word processor file or type directly into Blackboard. You **MAY NOT** upload an image of a handwritten essay.

Exercises

For each section you will be asked to complete an assignment. Assignments will be made available on Blackboard. Homework can be submitted in a variety of formats, but each assignment must be submitted as a single file that I can view and grade on Blackboard.

One possibility would be to type up your homework using the Equation Editor on Microsoft Word and save it as a PDF. Another would be to capture high-quality images of your homework using a phone or other device and combine into a single file, e.g. by pasting each image into a word processor file. Feedback will be provided in the form of comments your Blackboard file.

All work must be shown for full credit. Try to be as tidy as possible so that I can understand your work. I'm flexible as to file format provided I can view your submission on Blackboard. Submissions consisting of multiple image files will not be graded as it's too easy for me to lose my place and miss something. If I have trouble seeing your file, I will let you know and give you a chance to resubmit.

Research Paper

You will write a 2000-word research paper about a mathematics history topic of your choice. The

topic may be the development of a mathematical idea or a biography of a famous mathematician. Plan to have your topic selected by the beginning of October. Additional details will be provided later in the semester.

Subject Outline and Schedule

Below is a tentative subject outline and schedule for this course.

- I. Early Number Systems and Symbols (August 22 – 24)
- II. Mathematics in Early Civilizations (August 29 – 5)
- III. The Beginnings of Greek Mathematics (September 7 – 12)
- IV. The Alexandrian School: Euclid (September 14 – 19)
- V. The Twilight of Greek Mathematics: Diophantus (September 21 – 26)
- VI. The First Awakening: Fibonacci (September 28 – October 3)
- VII. The Renaissance of Mathematics: Cardano and Tartaglia (October 5 – 10)
- VIII. The Mechanical World: Descartes and Newton (October 12 – 17)
- IX. The Development of Probability Theory: Pascal, Bernoulli, & Laplace (October 19 – 24)
- X. The Revival of Number Theory: Fermat, Euler, and Gauss (October 26 – 31)
- XI. Nineteenth-Century Contributions: Lobachevsky to Hilbert (November 2 – 7)
- XII. Transition to the Twentieth Century: Cantor and Kronecker (November 9 – 14)
- XIII. Extensions and Generalizations: Hardy, Hausdorff, and Noether (November 16 – 22)
- XIV. Research Topic Overview (November 28 – 30)

QEP Mapped Course

Course Design: Communication Infused

To be successful in college and beyond, many sources (e.g., Morreale & Pearson, 2008) indicate that communication competencies are essential. Sul Ross recognizes that the current generation of undergraduate university students should receive training to navigate a global world as competent communicators in various contexts and channels of communication.

Through our Quality Enhancement Plan (QEP) called *Compass*, Sul Ross aims to equip you to navigate excellence in the 21st century by developing your communication skills across multiple courses. This mathematics course is designed to enhance your communication skills. Therefore, this course has the following QEP Student Learning Outcome:

QEP Student Learning Outcome

The student will create works that exhibit skill in prepared and purposeful communication (written, oral, or visual).

University Statements

Distance Education Statement: *Students enrolled in distance education courses have equal access to the university's academic support services, such as library resources, online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires secure login. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website. Directions for filing a student complaint are located in the student handbook.*

SRSU Disabilities Services: *Sul Ross State University (SRSU) is committed to equal access in compliance with Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. RGC students seeking accessibility services should contact Paulette Harris, Executive Assistant to the Vice President and Dean, at 830-279-3023 or email pharris@sulross.edu. Ms. Harris's office is at 2623 Garner Field Road, Uvalde, TX 78801 (this is the mailing address, too).*

University Libraries: *The Sul Ross Library offers FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, library.sulross.edu. SRSU RGC students may request InterLibrary Loans (ILLs) and book check outs from the Sul Ross Library to be picked up at the SWTJC library that is most convenient. Access requires your LoboID and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or phone (432-837-8123).*

The Southwest Texas Junior College (SWTJC) Library is also available on each campus for your physical use of the space or checking out books. Del Rio, Eagle Pass, and Uvalde students may use online resources available through SWTJC website, library.swtjc.edu. These libraries serve as pickup locations for your ILL or Document Delivery or book requests; to do so, choose the appropriate pick-up location when requesting materials from the Alpine campus.