

**FYS 106-L04 First Year Seminar in Mathematics or Computer Science: The Birth of Mathematics (CRN 15448)**

**Prerequisite:** MATH 101 (may be taken concurrently) or placement score

**Course Description:** This course is part of a learning community “It is Greek to Us” with ENG 110 and FYE-101. The other teacher is Prof. Candace Barrington. This course will explore important mathematical concepts discovered by Greek mathematicians and philosophers including Pythagoras, Euclid, Plato, and Archimedes, their roots in Egypt and Babylonia, and their application to art, music, geography, and astronomy.

**Course Objectives:**

1. to deepen your understanding of the mathematical topics covered
2. to develop an appreciation of mathematics as a human endeavor, by studying the historical context in which mathematical ideas are developed
3. to develop an appreciation for the specific contributions made by Greek civilization (especially in the period 600-200 BC) to the development of mathematics
4. to read and understand mathematical arguments.

**Course Instructor: Prof. Timothy V. Craine**

**Contact Information:**

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Office: Maria Sanford 219

<b>Office Hours</b>	Monday	12:15 – 1:45 PM 3:30 – 4:00 PM
	Wednesday	3:30 – 4:00 PM 6:45 – 7:15 PM

Other times by appointment

**Class Meeting Times:** Monday and Wednesday 2:00-3:15 PM in HB 329.  
(Note: there will be some days when we swap meeting times with ENG 110.)

**Course Requirements:**

- Attend and participate in class regularly.
- Complete homework assignments.
- Take two tests and a final examination (see schedule below).
- Write a research paper (see schedule below).

**Learning Resources:** Most readings and assignments will be posted on the website [www.greektous@pbwiki.com](http://www.greektous@pbwiki.com). In addition, there are two assigned texts:

Plato. *The Republic*. Translation by R.E. Allen. New Haven: Yale University Press, 2006. This will be available in the bookstore. You will need to purchase it before October 18.

Craine, Timothy V. *Introduction to Euclid with Geometer's Sketchpad*. This is a work in progress. The instructor will provide you with copies.

**Attendance:** Attendance at every class session is required. You are expected to arrive on time, stay for the entire class period, and actively participate in group work and class discussion. In the event of an emergency that precludes your attending class please contact me by phone or email as soon as possible, preferably before the start of class. Poor attendance will adversely affect the class participation grade (as well as leaving you unprepared for tests).

**Homework:** College students are expected to spend at least two hours outside of class for every hour in class working on this course. Thus for a three-credit course such as this, be prepared to spend *at least* 6 hours per week. Your daily assignments will include readings, short papers, introductory exercises, and problems to be turned in and graded. In addition, you will have one long-term assignment, the research paper. The best way to prepare for the tests and the final exam is to do the problems! All assignments will be posted on the web site [www.greektous@pbwiki.com](http://www.greektous@pbwiki.com).

**Getting Help:** In most mathematics classes, concepts are built up gradually in a logical sequence. Because we take a historical approach in this course, however, the topics covered will vary in their degree of difficulty. There may be times when you feel lost. At that point it is your responsibility to communicate your confusion to me. Do not hesitate to take advantage of my office hours, or call to make a special appointment to confer with me.

**Research Paper:** In conjunction with ENG 110, this project will be assigned September 20. Two drafts will be submitted and critiqued. The final paper is due November 22, and oral reports on the papers will be given in December.

**Assessment:**

Two Tests: October 6 and November 17 (15% each)	30%
Final Exam: December 16	15%
Research Paper (drafts due October 20 and November 10, Final paper due November 22, oral reports December 6–7)	25%
Homework (short papers and problem sets)	20%
Class Participation	10%
Total	100%

## University Policies:

1. You must take the final examination at the time specified in the course selection book. The times for scheduled for this learning community are Monday, December 13, 2:00–4:00 PM and Tuesday, December 14, 11:00 AM–1:00 PM. Do not make vacation plans that conflict with these times.
2. If you need course adaptations or accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible. My telephone numbers and office hours are given above. I will need a copy of the accommodation letter from Student Disability Services in order to arrange your class accommodations. Contact Student Disability Services, room 241, Copernicus Hall, if you are not already registered with them. Student Disability Services maintains the confidential documentation of your disability and assists you in coordinating reasonable accommodations with your faculty.
3. In the event of a weather emergency which requires curtailment or cancellation of classes, listen to WTIC (1080 AM), visit [www.ccsu.edu](http://www.ccsu.edu), or call (860) 832-3333 for the “general snow message.”
4. The last day to withdraw from a course is Monday, October 25. Approvals for withdrawal are not required; however, it is strongly recommended that students consult with their academic advisors prior to deciding to withdraw. Cessation of attendance, notice to the instructor, or telephone calls to the Enrollment Center are not considered official notice of a student’s intention to drop the course. After October 25 withdrawals are allowed only under extenuating circumstances and require approval of the course instructor, department chair and dean of the School of Arts and Sciences. Poor academic performance is not considered an extenuating circumstance.
5. You are responsible for understanding and abiding by the University’s policy on academic integrity. Information on the policy may be found at <http://www.ccsu.edu/AcademicIntegrity/>. This policy is rigorously enforced by the Department of Mathematical Sciences.

## Additional Policies for This Instructor:

1. Cell phones and other communication devices must be turned off at all times during class.
2. Make up tests. If you must miss one of the scheduled tests (October 6 or November 17) you must contact me immediately to arrange to make it up. Make up tests will only be given within 48 hours of the originally scheduled time.
3. Class will be scheduled in the Mac Lab in the Computing Center on several days, which will be announced in advance. On these days you must bring your CCSU ID to the Computer Center in order to be admitted to class.
4. I encourage collaborative learning, and you are welcome to work with a partner on homework assignments as long as you acknowledge his or her contribution. Your work on tests, the final exam, and the research essay, however, must be strictly your own. (See point 5 on Academic Integrity above.)

**FYS 106: Tentative Schedule of Topics** (shaded boxes indicate meetings with both professors)

Week	Monday	Wednesday
August 30–September 2	With ENG 110: Introduction to the courses. Background on Greek history. Role of Greek contributions to mathematics in relation to the rest of the world. Impact of Greece on Western civilization. Numeration.	
	Team teaching—will meet class on Tuesday and Thursday also.	
September 6 & 8	Labor Day—no class	Egyptian mathematics—accomplishments and influence on Greece.
September 13 & 20	Pythagoras and Thales Pythagorean music theory	Pythagorean music theory—“music of the spheres”
September 20 & 22	Assignment of Term Paper (Craine and Barrington) in FYS 106 class, Monday 9/20	Pythagoreans and irrational numbers: the golden ratio—applications to architecture
September 27 & 29	Pythagoreans and irrational numbers: the square root of 2	Zeno’s paradoxes
October 4 & 6	Review	Test 1
October 11 & 13	Introduction to geometric software	Euclid—definitions and axioms
October 18–21	With ENG 110: Reading of Plato’s <i>Republic</i> especially Books III and VII. Particular emphasis on Plato’s views of mathematics and the role of mathematics in education.	
	Team teaching—will meet class on Tuesday and Thursday also.	
October 25 & 27	Euclid—Propositions I.1-I.12	Euclid—Propositions I.13-26
November 1 & 3 (Prof. Barrington is away, class will meet four days)	Euclid—Propositions I.27-32 Workshop on Second draft of term paper	Euclid—Propositions I.33-I.48 Platonic Solids and the Greek elements (earth, air, fire, and water) (Hands-on)
November 8 & 10	Three unsolved problems of Greek Mathematics (squaring circle, duplicating cube, trisecting angle)	Aristarchus—“the Greek Copernicus.” Eratosthenes measures the earth.
November 15 & 17	Review	Test 2
November 22	Archimedes—mechanics Term Papers due (final version)	Thanksgiving Break
November 29 & December 1	Archimedes—sphere and cylinder	Archimedes—computing pi
December 6–8	With ENG 110, oral reports on term papers. Reports will continue on Tuesday Dec. 7 in ENG 110	Review for Final Exam
December 13 & 14	Final Exams 2:00-4:00 PM Dec. 13; 11:00-1:00 PM Dec. 14	

## Bibliography

The following is a partial list of resources used by the instructor.

Bernal, Martin. *Black Athena: The Afroasiatic Roots of Classical Civilization*, Volume 1. New Brunswick, NJ: Rutgers University Press, 1987.

Boyer, Carl B. *A History of Mathematics*. New York: John Wiley, 1968.

Eves, Howard. *Great Moments in Mathematics (before 1650)*. Washington, D.C.: Mathematical Association of America, 1980.

Fowler, D.H. *The Mathematics of Plato's Academy: A new reconstruction*. Oxford: Clarendon Press, 1987.

Grattan-Guinness. *The Rainbow of Mathematics: A History of the Mathematical Sciences*. New York: Norton, 1997.

Hallerberg, et. al., editors. *Historical Topics for the Mathematics Classroom*. Washington, D.C.: National Council of Teachers of Mathematics, 1969.

Heath, Sir Thomas. *Aristarchus of Samos: The Ancient Copernicus*. Oxford: Clarendon Press, 1913, 1966.

Heath, Sir Thomas. *A History of Greek Mathematics, Vol. 1 and 2*. New York: Dover Press, 1921, 1981.

Heath, Sir Thomas. *Euclid's Elements (translation)*. On line version at <http://aleph0.clarku.edu/~djoyce/java/elements/elements.html>.

Joseph, George Gheverghese. *The Crest of the Peacock: Non-European Roots of Mathematics*. Princeton, NJ: Princeton University Press, 1991, 2000.

Kalkave, Peter. *Plato's Timeus: Translation, Glossary, Appendices, and Introductory Essay*. Newburyport, MA: Focus Publishing, 2001.

Powell, Arthur B. and Frankenstein, Marilyn. *Ethnomathematics: Challenging Eurocentrism in Mathematics Education*. Albany, NY: SUNY Press, 1997.

Stein, Sherman. *Archimedes: What Did He Do Besides Cry Eureka?* Washington, D.C.: Mathematical Association of America, 1999.

Zaslavsky, Claudia. *The Multicultural Mathematics Classroom: Bringing in the World*. Portsmouth, NH: Heinemann, 1996.