Course Syllabus
Math 467W.01
The Evolution of Mathematics
3 Credits
Spring 2008

1. **Class meeting information:** Class meets in 201 LDB
   Tuesday and Thursday 2:00 - 3:30 pm

2. **Professor:** Dr. Jacqueline Jensen
   Office: 410 Lee Drain
   Office Phone: 294-3517
   e-mail: jensen@shsu.edu
   web-page: http://www.shsu.edu/~mth_jaj

3. **Office Hours:**
   Monday 9:00 - 10:00 am
   Tuesday and Thursday 1:30 - 2:00 pm
   Wednesday 9:00 - 10:00 am and 1:00 - 2:00 pm
   and, of course, by appointment.

4. **Course Description:** An introduction to the historical development of fundamental mathematical ideas from antiquity to the present. Writing Enhanced. Students taking Math 467 must have completed Math 143 with a grade of C or better or have consent of instructor. Class will be lecture-oriented, with much discussion by students.

5. **Course Objectives:** Students completing this course should have mastery of the following major concepts. Other techniques and ideas will also be covered.

   - numeral systems
   - Babylonian and Egyptian mathematics
   - Pythagorean mathematics
   - Euclidean mathematics
   - Later Greek mathematics
   - Chinese, Hindu, and Arabian mathematics
   - European mathematics up through the 19th century

6. **Required Textbook:** *An Introduction to the History of Mathematics* (6th edition), by Howard Eves, ISBN 0030295580

7. **Required Supplies:** No other supplies required.

8. **Attendance Policy:** Students are expected to attend every class. If class must be missed, the student is expected to get the notes from a classmate, and to check the web-page for announcements and updated assignments. The professor will keep a record of attendance.

   Tardiness: Students are expected to arrive to class on time. If a student is perpetually late, they will be asked to not attend class unless they arrive on time. If tardiness becomes a problem for the class as a whole, people who arrive late will not be permitted to enter the class. If this stricter policy becomes necessary, there will be an announcement made in class and posted on the web-page.

9. **Assignments:**

   (a) **Homework:** Homework will be assigned in class each day. Assignments can be found online at:

   http://www.shsu.edu/~mth_jaj/math467/due.s08.html

   Each week some of these problems will be collected and discussed. You may turn problems in before or after the discussion. Correct problems submitted before they are discussed are worth up to 10 points. Problems submitted after the discussion will be worth 5 points if they are correct. Due dates will be given in class as the semester progresses.

   It is your responsibility to ask questions about homework problems which you were not able to complete or did not understand, especially regarding problems which are not collected. It is your responsibility to come to office hours, or otherwise contact someone for help. You may contact me via e-mail if you cannot make it to office hours, and I will try to answers questions as clearly as I can via e-mail. It is also your responsibility to do as many problems from each section as you need to in order to feel comfortable with the material.

   (b) **Homework Format:** All homework should have your name on the top. You should write out the problem to be answered, or at least paraphrase it on your homework paper. All homework must have ragged edges trimmed. Also, homework must be legible and neat. Homework not conforming to these standards will not be graded. Remember that this is a writing enhanced course, and your work should reflect those standards. In other words, you should use complete sentence and form a coherent argument or description in your solutions.

   At least one problem per week must be typed in LaTeX and submitted in that form.

   (c) **Class participation:** This will count towards your homework grade. Students will be asked to share their solutions to problems. This will be on a volunteer basis, but each student must present at least twice during the semester to avoid have their grade negatively effected. During student presentations, the rest of the class is encouraged to ask questions, and to think critically about the solution presented by the classmate. The class will be responsible for making sure that solutions presented are correct.

   Presentations will be scored in the following way:

   - Accuracy of the problem you present, including following guidelines below.
   - Defense of your work, including, including following guidelines below.
   - Constructive criticism of classmates work, including following guidelines below.

   Points: You will be awarded a points in the following ways:

   - P - presentation points awarded
           5 pts - Correct presentation
           2-4 pts - Presentation with error(s)
   - Q - asking a good question of the presenter
   - C - an oral contribution other than the two categories above
   - I - contributing a demonstration of mathematical insight

   Remember that the presenter will always have the first chance to answer a question.

   Guidelines For Your Presentation:

   - Write the problem on the board.
   - State what method/theorem/idea you will use.
   - Clearly explain each step.

   General Guidelines

   - You must answer you classmates' and professor's questions in a respectful manner.
   - You must ask questions in a respectful manner. You are only to ask questions, not suggest another technique. In many cases, there is more than one way to solve the problem - do not assume that the presenter's method is wrong only because you did the problem differently.

- Do not use "stupid", "trivial", "obvious", etc.
- Its OK to say, "I'm not sure that I understand your question." It is not OK to say, "Your question doesnt make sense."
- Its OK to say, "Can you explain how you got from line 3 to line 4?" It is not OK to say, "Line 4 is wrong," or "Line 4 doesn't make sense."
- Talk to the class, not to the board.

10. **Another written assignment:** Each student will complete a paper during the course of the semester. I will provide a list of possible topics. Each student much choose a topic and notify me by Thursday, 24 January 2008. No two students will be allowed to choose the same topic, and topics are first-come first-served, so feel free to notify me of your topic before that date. **The written assignment will be worth 25% of your grade and will require the following:**

   - (10 points) Notify me of your topic on or before Thursday, 24 January 2008.
   - (10 points) Find a mathematical journal article in some way related to your research. You should acquire this paper and provide me with a copy of it on or before Tuesday, 5 February 2007. This is supposed to give you an idea of what your paper should look like.
   - (20 points) Write an outline of the paper - include titles of sections for the paper and a brief (phrase or sentence) of what will be covered in each section. This outline should be TeX-ed and is due on Tuesday, 5 February 2008. This should be a brief outline. A more detailed outline will be due later.
   - (30 points) A detailed outline of the paper - include titles of sections and subsections indicating clearly what will be involved in each section. This outline should be TeX-ed and is due on Thursday, 6 March 2008. This is the same date as your mid-term exam. Please plan accordingly. This should include a thorough list of references. If you have any questions about whether or not your references are reliable, please talk to me. Notice that *Wikipedia* is not a reliable reference.
   - (50 points) A rough draft of the paper will be due on Tuesday, 1 April 2008. You should use TeX, with the "article" or "amsart" document class, and use the "section" and "subsection" commands. The paper should include a title and an abstract (use \{begin}abstract and \{end}abstract for the abstract environment). The paper must include references (using the bibliography environment). Feel free to include pictures, figures, etc. Ask me about any typesetting questions. I will not put page restrictions on the paper, but remember that it is a major portion of your grade. Talk to me about these requirements if you have any questions.
   - Copies of the rough drafts of the papers will be distributed, to allow one classmate to comment on your rough draft. It is expected that there will be no spelling errors, typos, or grammatical issues in the final version.
   - (100 points) The final version of the paper will be due on Tuesday, 29 April 2008. Each student will give a short presentation about their paper in the last 3 class periods. A sign up sheet will be distributed later this semester.
   - Any student who plagiarizes any portion of the assignment will receive a 0 on the entire project and will be reported to the Dean of Students. Students may receive a grade of F for the course if caught plagiarizing.

   No late assignments will be accepted.

Suggested Topics for Papers

- Possible number sense in the animal world
- Advantages and disadvantages of bases other than 10
- Inductive mathematics vs. deductive mathematics
- Grotefend, Rawlinson, and the Behistun Rock

- Napolean, Campollion, and the Rosetta Stone
- Pythagorean number mysticism
- How the discovery of incommensurable magnitudes produced a crisis in the development of mathematics
- The importance of unsolved problems in mathematics
- Mnemonics in elementary mathematics
- Origin of the axiomatic method, both evolutionary and revolutionary accounts
- Sir Henry Billingsley
- The case for Archimedes as the inventor of integral calculus
- The burning of books in China in 213 BC
- Chinese mathematical works prior to 1200
- Matteo Ricci
- The influence of Chinese and Hindu mathematics on European mathematics
- Hindu mathematical works prior to 1200 AD
- Al-Kashi's contributions to mathematics
- History of early Japanese mathematics
- Gerbert and his influence on mathematics
- The transmission of ancient Greek and Hindu learning to Western Europe after the Dark Ages
- Luca Pacioli
- Leonardo da Vinci and mathematics
- The life and works of Robert Recorde
- Viète as the first really modern mathematician
- Harriot as the father of the modern theory of equations
- Pernicious effects of the Inquisition
- The greatest French mathematician of the seventeenth century
- The five most important French mathematicians of the seventeenth century
- The relation of Zeno's paradoxes to the calculus
- The Greek contribution to the development of the integral calculus
- The five most important British mathematicians of the seventeenth century
- Napolean Bonaparte and mathematics
- Pierre Méchain's tragic error
- The two Sir William Hamiltons
- De Morgan as one of the most quoted mathematicians
- Some nineteenth century prodigies
- Augustus Ferdinand Möbius
- Giuseppe Peano
- Jacob Steiner and Julius Plücker contrasted
- Why there are so few eminant women in mathematics
- Kurt Gödel and his theorems
- Anna Johnson Pell Wheeler

11. **Exams:** There will be one exam during the semester. It is tentatively scheduled to occur on **Thursday, 6 March**. Any changes to this schedule will be announced in class and posted on the web-page. If a student misses an exam, the student will be allowed to replace that exam score with their score on the final exam <u>if</u> the student takes and passes the next exam at the regularly scheduled time.

    The **final exam** will be held on Thursday, 15 May, 2008 from 2:00 - 4:00 pm in our regular classroom. It will be comprehensive.

12. **Grading Plan:** The course grade is based on:

Homework and Class Participation	Paper	Exam	Final Exam
30%	25%	20%	25%

    The course grade will be assigned via the following table:

Percentage earned	90 - 100%	80 - 89%	70 - 79%	60 - 69%	0 - 59%
Grade	A	B	C	D	F

    There is no additional curve in this class, and no extra credit, so keep up as the semester progresses.

13. **Academic Dishonesty:** All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on and examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

14. **Classroom Rules of Conduct:** Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university.

    Cellular telephones and pagers must be turned off before class begins. Since they are to be turned off, they should not be visible in class. If cell phones become an issue in class, students will be asked to leave if their phone should ring during class.

    Students are prohibited from using tobacco products in class, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, wearing inappropriate clothing or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

15. **Visitors in the Classroom:** Unannounced visitors to class must present a current, official SHSU identification card to be permitted in the classroom. They must not present a disruption to the class by their attendance. If the visitor is not a registered student, it is at the instructor's discretion whether or not the visitor will be allowed to remain in the classroom.

16. **Additional Information** All information on this syllabus is subject to change. Any changes will be announced in class.