

Mathematics 3820H – Mathematics from medieval to modern times

TRENT UNIVERSITY, Fall 2016

Project

Proposal due on Friday, 14 October.

Project due on Friday, 16 December.

Format. Essays are probably the most straightforward format available to you for the project, but I am willing to consider non-essay formats if you wish to try one. Just be warned that non-essay formats are generally harder to carry off well than essays, and should be discussed with me before putting a lot of effort into pursuing them. You are also permitted to do your projects in groups, but be warned that I will expect more from group than individual projects.

The minimum length for an individual essay project ought to be about 2000 words (approximately eight typed pages), and I do expect decent grammar, spelling, and style. I'm not fussy about formatting and bookkeeping, such as how you handle footnotes and/or endnotes, so long as the result is consistent, complete, and readable.

Proposal. The proposal should describe the format of your project, give the title and the thesis or objective, a very general outline, and a preliminary list of sources that you intend to use. Note that it does *not* commit you to following through on any or all of this for your project, though once your proposal has been returned, you should probably run any really major deviations from what you proposed (or I suggested) by me for a sanity check.

Topics. Possible topics mostly fall into two categories, mathematical and historical, for which I have somewhat different expectations, described below. Either way, you should stick to topics which have a significant connection to the history of mathematics after about 450 A.D., with the major exception being mathematics in India before this date. If you have an idea for a topic that doesn't really fall into either category, please talk it over with me before starting serious work on it.

Mathematical. A project on a mathematical topic in MATH 3820H would most likely boil down to choosing some piece of mathematics done at some point after 450 A.D. or so and presenting it. For example, one might pick a problem and look at how people tried to solve it and what that led to. This would mean writing an exposition on the topic in question, with some historical background for context.

Historical. Projects on a historical topic could take a number of different tacks. The most straightforward would probably be a narrative of the activities and influence of some mathematician or group of mathematicians – which would necessarily involve describing some of their mathematics! – making due allowance for gaps and inconsistencies in the historical record and the difficulties of inferring whether some event or person affected another. For this sort of project, you could also compile a reasonable set of possible individuals or groups to work on by consulting the text and/or the books mentioned above. A variation on this theme which would come close to the mathematical sort of project would be to describe how some body of results or techniques evolved.

Other. A more ambitious sort of project would be one which tried to look at how the development of mathematics influenced other things, such as the development of philosophy, or was itself affected by them. One cute variation on this would be to write an alternate

history working out the effects of a change in some part of the history of mathematics. (If you give this a go, do try to keep the change as plausible as you can!) Another possibility is to do a project on a topic related to the history of mathematics, but not quite of it. For example, one could look at the history of mathematics education or the uses of the history of mathematics in teaching mathematics.

Help. Finally, I would be happy to look at and criticize outlines, fragments, and drafts of your proposal and/or project if you produce them early enough so that I have the time to read and think about them.

Some possible places to start. (This is *not* an exhaustive list!)

Online

General resources

0. *Your favourite search engine!*
1. *Google Books* <http://books.google.ca>
2. *Open Library* <http://openlibrary.org>
3. *Project Gutenberg* <http://www.gutenberg.org>
4. *The Universal Digital Library* <http://www.ulib.org>
5. *Wikipedia* <http://www.wikipedia.org/>

Specialized resources

1. *Web resources on the history of mathematics:*
<http://www.dcs.warwick.ac.uk/bshm/resources.html>
Maintained by *The British Society for the History of Mathematics*.
2. *History/Biography at The Math Forum:*
<http://mathforum.org/library/topics/history/>
3. *History of Mathematics at Math Archives* (University of Tennessee - Knoxville):
<http://archives.math.utk.edu/topics/history.html>
4. *History of Mathematics at Mathematics Resources on the Internet:*
<http://www.abc.se/~m9847/matre/history.html>
Maintained by Bruno Kevius.
5. *The History of Mathematics:*
<http://www.maths.tcd.ie/pub/HistMath/>
Maintained by David R. Wilkins.
6. *MacTutor history of mathematics archives:*
<http://www-history.mcs.st-andrews.ac.uk/>
7. *The Euler Archive:*
<http://www.math.dartmouth.edu/~euler/>
8. *Galileo Portal:*
<http://brunelleschi.imss.fi.it/portalegalileo/index.html>
9. *Gauss' Works:*
<http://gdz.sub.uni-goettingen.de/dms/load/toc/?IDDOC=38910>

10. *The Newton Project*:
<http://www.newtonproject.sussex.ac.uk/>
11. *The Newton Project – Canada*:
<http://www.isaacnewton.ca/>
12. *Wilbour Hall*:
<http://www.wilbourhall.org/index.html>
 This is an amazing compilation of links to original works in mathematics and astronomy, many translated into English. Especially good for ancient mathematics. Maintained by J. Leichter.

Some books

- The Heritage of Thales*, by W.S. Anglin & J. Lambek,
 Springer Verlag, New York, 1995, ISBN 0-387-94544-X.
- The History of the Calculus and Its Conceptual Development*, by Carl B. Boyer,
 Dover Publications, New York, 1959, ISBN 0-486-60509-4.
 Originally published by Hafner Publishing Co. Inc., 1949, as *The Concepts of the Calculus, A Critical and Historical Discussion of the Derivative and the Integral*.
- A History of Mathematics* (2nd Edition), by Carl B. Boyer & Uta C. Merzbach,
 John Wiley & Sons, Inc., 1991, ISBN 0-471-54397-7
 (The 3rd edition is due out in November, 2010.)
- A History of Mathematical Notations*, by Florian Cajori,
 Dover Publications, New York, 1993, ISBN 0-486-67766-4.
 Originally published in two volumes by Open Court Publishing, Chicago, in 1928 and 1929.
 Volume I is available online at the Internet Archive:
<http://www.archive.org/details/historyofmathema031756mbp>
- Classics of Mathematics*, edited by Ronald Calinger,
 Prentice-Hall, New Jersey, 1995, ISBN 0-02-318342-X.
- A Contextual History of Mathematics*, by Ronald Calinger,
 Prentice-Hall, Upper Saddle River, New Jersey, 1999, ISBN 0-02-318285-7.
- An Introduction to the History of Mathematics* (3rd edition), by Howard Eves,
 Holt, Rinehart and Winston, New York, 1969.
- Mathematical Thought from Ancient to Modern Times*, by Morris Kline,
 Oxford University Press, New York, 1972.
- Mathematics in Western Culture*, by Morris Kline,
 Oxford University Press, New York, 1953.
- History of Mathematics*, in two volumes, by David E. Smith,
 Dover Publications, New York, 1958, Vol. I: ISBN 0-486-20429-4, Vol. II: ISBN 0-486-20430-8.
 Originally published in 1923 (Vol. I) and 1925 (Vol. II) by Ginn and Company (?).
- A Concise History of Mathematics* (4th Edition), by Dirk J. Struik,
 Dover Publications, New York, 1987, ISBN 0-486-60255-9.

A History of Mathematics, by Jeff Suzuki,
Prentice-Hall, New Jersey, 2002, ISBN-10: 0130190748, ISBN-13: 978-0130190741.

A journal

Historia Mathematica, a journal on the history of mathematics, published by Elsevier.
Available at Bata Library, in print and/or electronic form, depending on the issue.

There are many more (re)sources online, in the library, and elsewhere.