

A TASTE OF THE MOORE METHOD

The Moore method of learning mathematics, pioneered by Robert Lee Moore (1882-1974) at the University of Texas, is a particular instance of what is sometimes called inquiry-based learning or guided discovery. In the Moore method, at the beginning of each unit students are presented with a list of statements to be proven or disproven. Students are expected to spend their time outside of class figuring out which statements are true and which are false, by finding a proof or a counterexample, and then carefully documenting this proof (or counterexample) in their own notes. Time in class on Wednesdays will be spent with students taking turns presenting their proofs or counterexamples, with all class members being responsible for ensuring the presentation is correct – or correcting it if it is not — by raising questions about any point which is unclear. In the form implemented by Moore, students were expected to work entirely on their own outside of class, without researching outside sources, and the presenters were selected entirely at the instructor's pleasure. As in the version I have used successfully in the past (for teaching the math specialist's Introduction to Topology, MAT 327), I am willing to permit students to work together in small groups if they choose, but only after having attempted the problems by themselves, and provided the composition of the group which worked on any given problem is disclosed in the written record, and provided the write-up of each solution is done individually and in isolation by each student, without copying from notes produced by other students or by the group. I would insist on not consulting sources other than the distributed notes, the instructor, the TA, and the group. I prefer to have each student turn in a list of the problem and example numbers they are ready to present at the beginning of class each Wednesday, and then I choose a presenter for each statement from among those who claim to have a proof (or counterexample). Students become active discoverers of mathematics, rather than passive receivers, and based on my own experience, master the material they learn better than in a traditional lecture format. The downside is that not all material is well-adapted to the Moore method, and it works only with classes consisting of not too many (say less than 40) students. It also relies on having a good set of scaffolded statements to work from. While I am not aware of any suitable set of statements which covers all the standard topics in *differential* topology, I have recently become aware of a very promising textbook-in-progress by Mike Starbird and Francis Su which does cover a nice variety of topics in geometric, combinatorial and algebraic topology. From these notes, I have selected chapter 12 (classification of 2-manifolds) to be covered by Moore method on Wednesdays, while I will use the Thursday lectures to cover the traditional topics of a differential topology course in a more standard lecture format.

INTEGRITY

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The University of Toronto's Code of Behaviour on Academic Matters outlines the behaviours that constitute academic misconduct, the processes for addressing academic offences, and the penalties that may be imposed. You are expected to be familiar with the contents of this document. Potential offences include, but are not limited to:

On assignments: Using someone else's ideas or words without appropriate acknowledgement. Obtaining or providing unauthorized assistance on any assignment. If you work on an assignment question with others, please indicate whom. Do not consult outside sources, apart from those mentioned above. Also, before consulting with others do try doing the assignments on your own: the more you practice solving problems without relying on other sources, the more resourcefulness you'll develop for solving problems on tests and exams! In any case, the actual write-up of the

solution to a problem should be done in isolation from others, without copying from notes produced by others or your group. This ensures that your solution is truly your own, and that you understand the course material, and that your grade reflects your own understanding.

On tests and exams: Using or possessing any unauthorized aid, including a cell phone. Looking at someone else's answers. Letting someone else look at your answers. Misrepresenting your identity. Submitting an altered test for re-grading.

Misrepresentation: Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes. Falsifying institutional documents or grades. All suspected cases of academic dishonesty will be investigated following the procedures outlined in the Code of Behaviour on Academic Matters. If you have any questions about what is or is not permitted in this course, please do not hesitate to contact me.

DIVERSITY AND ACCOMMODATIONS / COMMUNICATIONS POLICY

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or Accessibility Services at (416) 978=8060; accessibility.utoronto.ca

COMMUNICATIONS POLICY

Course material will be posted at the website www.math.toronto.edu/mccann/425 and are not to be reproduced or distributed without written permission of the instructor.

Questions concerning the subject matter of the course should be brought to lectures, tutorials, or office hours. Administrative concerns including documentation justifying absences should go by e-mail to the TA peter.angelinos@mail.utoronto.ca or myself mccann@math.toronto.edu as appropriate. All re-grading concerns should be raised with the TA. Please include the course number MAT 425F (or MAT 1340F if you are enrolled in the graduate student version of this course) in the subject heading. I will endeavour to respond to emails within 72 hours.

The university requires students to be informed that all course marks are tentative until approved by the Department chair and Dean's office, and recorded by the faculty registrar.