Math 052 Fundamentals of Mathematics

Fall 2020 - IN PERSON MODE

Course Overview:
MATH 052. QR: Fundamentals of Mathematics. 3 Credits. Emphasizing proofs, fundamental mathematical concepts and techniques are investigated within the context of number theory and other topics. Prerequisites for the course are Math 21 or Math 23. Credit cannot be given for more than one of Math 52 and CS 64.

The course is designed to give a firm foundation in sophisticated Mathematics through the idea of **proofs**. This is accomplished by introducing the standard mathematical structures and investigating them thoroughly. The transitional from computational mathematics to theoretical mathematics can be a difficult one. This class should help bridge that gap.

Topics will be presented with a level of depth and rigor appropriate for students pursuing degrees in technical fields such as mathematics, statistics, engineering, or the physical sciences. Topics covered: Language of Logic and Proof, Techniques of Proof, Induction, Sets, Functions, An Introduction to Number Theory, Equivalence Relations and Partitions, Cardinality

**Learning Outcomes:**
At the end of this course, you will be ready to take and do well in the more theoretical math courses such as Linear Algebra, Geometry, Abstract Algebra, and Real Analysis. Students will be able to...

1. Write sound logical proofs on various topics with correct terminology, notation, and grammar.
2. Think like a mathematician: analyze how they arrive at conclusions, distinguishing definitions from theorems.
3. Use foundational material in various settings.
4. Make connections between various areas of math.

**Materials:**
Topics covered:
- Language, Logic and Proof
- Techniques of Proof
- Induction
- Sets
- Functions
- An Introduction to Number Theory
- Equivalence Relations and Partitions
- Cardinality
Notetaking: The Course Notes on Blackboard in the Course Materials folder cover 95% of what I present in class. You can use these notes instead of copying everything I write on the board so that you can listen and absorb the material better during class.

Class time: The class meets 2:20pm to 3:10 pm M W F in Votey 205

Attendance: Attendance is required. In accordance with University Policy, I allow students to miss classes due to religious observances, varsity sporting matches or any other activities stated in the UVM attendance policy. You must email me ahead of time telling me that you will be absent. If you will be absent, plan to get the class notes from a peer and read the lesson plans posted on Blackboard. Attendance is 5% of the final grade.

Instructor Information:
Name: Dr. Dan Hathaway
Email: Daniel.Hathaway@uvm.edu *Include Math 052B in the subject line
Office: Innovation Bldg, Room 311

Office Hours:
Students are always welcome to ask me questions before or after class with social distancing and masks or send me an email for a fast response.

There will be no IN PERSON office hours due to covid. Office hours will be by appointment on Microsoft Teams. To sign up, please send me an email 24 hours in advance for an appointment between 12:10 pm and 1:00 pm MWF and I will send you back a meeting notice. Please feel free to email me to set up an appointment at another time if you have class during these office hours.

Blackboard:
Blackboard will be used for Announcements, grades, and the final exam.

Homework:
There will be weekly homework assignments due on Wednesdays at the beginning of class. The lowest 2 homework scores will be dropped. For each assignment that you type in Latex, you will receive 5 bonus points on that assignment. You will not get bonus points for any other software such as Microsoft Word. Late homework will not be accepted.

You are encouraged to work with other classmates on your homework, but the write-up you turn in must be your own.

Your objective on homework should be to write a clear, concise exposition of each solution. This means all work that is required to arrive at an answer should be included and all proofs must be written explanations in complete, grammatical sentences with correct mathematical terminology and notation. Academic honesty demands that you indicate clearly that you have referred to people, books, or sources of any kind. Responsible work habits and consideration for the grader dictate that late homework cannot be accepted.
**Midterm Exams:** There will be 2 midterm exams. The dates of the midterms are **Wednesday, Sept 30** and **Wednesday, November 4.** You may bring one 8 x 11 inch sheet of paper filled front and back to the first midterm exam and two 8 x 11 inch sheets of paper filled front and back to the second midterm exam. Each test is **cumulative** from the beginning of the course. No books, calculators or electronic devices. No make-up exams.

**Final Exam:** There will be a **cumulative** final exam given at the end of the semester. The final exam will be held on TBD on Blackboard. No In Person Final Exams. The Final exam is open book and open notes, but no calculators, electronic devices, software or internet may be used on the exams. You are on the UVM Honor system.

**Computation of grade:**

Attendance: 5%
Homework 40%
Midterm1: 17%
Midterm2: 18%
Final Exam: 20%

**Point Values for Final Grades:**

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<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A+</td>
<td>97–100%</td>
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<tr>
<td>A</td>
<td>93–96%</td>
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<tr>
<td>A-</td>
<td>90–92%</td>
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<tr>
<td>B+</td>
<td>87–89%</td>
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<tr>
<td>B</td>
<td>83–86%</td>
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<tr>
<td>B-</td>
<td>80–82%</td>
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<tr>
<td>C+</td>
<td>77–79%</td>
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<tr>
<td>C</td>
<td>73–76%</td>
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<tr>
<td>C-</td>
<td>70–72%</td>
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<tr>
<td>D+</td>
<td>67–69%</td>
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<tr>
<td>D</td>
<td>63–66%</td>
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<td>D-</td>
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**Technical support for students:**
Students should contact the Helpline (802-656-2604) for support with technical issues.

**The following are University Policies:**

**Academic Integrity**
University policy addresses plagiarism, fabrication, collusion, and cheating.
https://www.uvm.edu/sites/default/files/UVM-Policies/policies/acadintegrity.pdf (PDF link)
**Student Learning Accommodations**
In keeping with University policy, any student with a documented disability interested in utilizing ADA accommodations should contact Student Accessibility Services (SAS), the office of Disability Services on campus for students. SAS works with students and faculty in an interactive process to explore reasonable and appropriate accommodations, which are communicated to faculty in an accommodation letter. All students are strongly recommended to discuss with their faculty the accommodations they plan to use in each course. Faculty who receive Letters of Accommodation with Disability Related Flexible accommodations will need to fill out the Disability Related Flexibility Agreement. Any questions from faculty or students on the agreement should be directed to the SAS specialist who is indicated on the letter.

**Contact SAS:**
A170 Living/Learning Center;
802-656-7753
access@uvm.edu
www.uvm.edu/access

**Course Evaluations**
All students are expected to complete an evaluation of the course at its conclusion. Evaluations are anonymous and confidential. The information gained including constructive criticisms will be used to improve the course.

**Religious Holidays**
Students have the right to practice the religion of their choice. If you need to miss class to observe a religious holiday, please submit the dates of your absence to me in writing by the end of the second full week of classes. You will be permitted to make up work within a mutually agreed-upon time. [https://www.uvm.edu/registrar/religious-holidays](https://www.uvm.edu/registrar/religious-holidays)

**Academic Integrity**
The policy addresses plagiarism, fabrication, collusion, and cheating. [https://www.uvm.edu/policies/student/acadintegrity.pdf](https://www.uvm.edu/policies/student/acadintegrity.pdf)

**Grade Appeals**
If you would like to contest a grade, please follow the procedures outlined in this policy: [https://www.uvm.edu/policies/student/gradeappeals.pdf](https://www.uvm.edu/policies/student/gradeappeals.pdf)

**Grading**
For information on grading and GPA calculation, go to [https://www.uvm.edu/registrar/grades](https://www.uvm.edu/registrar/grades)

**Code of Student Conduct**
[http://www.uvm.edu/policies/student/studentcode.pdf](http://www.uvm.edu/policies/student/studentcode.pdf)

**Intellectual Property Statement/Prohibition on Sharing Academic Materials**
Students are prohibited from publicly sharing or selling academic materials that they did not author (for example: class syllabus, outlines or class presentations authored by the professor, practice questions, text from the textbook or other copyrighted class materials, etc.); and students are prohibited from sharing assessments (for example homework or a take-home examination). Violations will be handled under UVM’s Intellectual Property policy and Code of Academic Integrity.

FERPA Rights Disclosure
The purpose of this policy is to communicate the rights of students regarding access to, and privacy of their student educational records as provided for in the Family Educational Rights and Privacy Act (FERPA) of 1974.
http://catalogue.uvm.edu/undergraduate/academicinfo/ferparightsdisclosure/

Promoting Health & Safety
The University of Vermont’s number one priority is to support a healthy and safe community:
Center for Health and Wellbeing
https://www.uvm.edu/health
Counseling & Psychiatry Services (CAPS)
Phone: (802) 656-3340
C.A.R.E. If you are concerned about a UVM community member or are concerned about a specific event, we encourage you to contact the Dean of Students Office (802-656-3380). If you would like to remain anonymous, you can report your concerns online by visiting the Dean of Students website at https://www.uvm.edu/studentaffairs

Final Exam Policy
The University final exam policy outlines expectations during final exams and explains timing and process of examination period. https://www.uvm.edu/registrar/final-exams

Alcohol and Cannabis Statement
As a faculty member, I want you to get the most you can out of this course. You play a crucial role in your education and in your readiness to learn and fully engage with the course material. It is important to note that alcohol and cannabis have no place in an academic environment. They can seriously impair your ability to learn and retain information not only in the moment you may be using, but up to 48 hours or more afterwards. In addition, alcohol and cannabis can:
Cause issues with attention, memory and concentration
Negatively impact the quality of how information is processed and ultimately stored
Affect sleep patterns, which interferes with long-term memory formation
It is my expectation that you will do everything you can to optimize your learning and to fully participate in this course.

COVID 19 Policy section
General statement regarding potential changes during the semester:
http://catalogue.uvm.edu/
The University of Vermont reserves the right to make changes in the course offerings, mode
of delivery, degree requirements, charges, regulations, and procedures contained herein as educational, financial, and health, safety, and welfare considerations require, or as necessary to be compliant with governmental, accreditation, or public health directives.

**Green and Gold Promise:**
The [Green and Gold Promise](#) clearly articulates the expectations that UVM has for students, faculty, and staff to remain compliant with all COVID-19 recommendations from the federal CDC, the State of Vermont, and the City of Burlington. The [Code of Student Conduct](#) outlines policies related to violations of the Green and Gold Promise. Sanctions for violations include fines, educational sanctions, parent notification, probation, and suspension.