

Financial Mathematics 1 (CRN: 13509)
Fall 2023
MATH 372.01 (3 credits), Tu-Th 9:25A–10:40A, Wickersham 101

Instructor: Dr. Buchanan

Office: Wickersham 203-1, Phone: 871-7305, FAX: 871-7948

Office Hours: 11:00A-12:00N (M–F) or by appointment

Email: Robert.Buchanan@millersville.edu (**preferred**)

Textbook: *Mathematics of Investment and Credit*, 7th edition, Samuel A. Broverman, ACTEX Publications, Inc., Winsted, CT, 2017, ISBN: 978-1-63588-221-6

Calculator: The Texas Instruments [BA II PLUS](#) calculator is approved for use on the actuarial exams. Students should practice solving problems using this calculator prior to taking the actuarial examination. Students may also use the Texas Instruments [BA II PLUS PROFESSIONAL](#) calculator.

There are calculator emulator applications for iOS and Android devices which may be used in class; however, only the actual calculator may be used on the official [SOA](#) Exam FM. It is well worth the expense to get your own TI BA II PLUS calculator and become familiar with its features and operations.

Objectives: MATH 372 provides an introduction to the topics tested on the [Society of Actuaries](#) Exam FM and [Casualty Actuarial Society](#) Exam 2. Upon completion of this course the student will understand:

- interest rates and the time value of money,
- annuities,
- loan repayment,
- bonds,
- yield rates of investments,
- term structure of interest rates,
- asset liability management, duration, and immunization,
- derivative securities,
- forwards, futures, call and put options,
- investment strategies,
- use of derivatives to manage risk,
- swaps, and
- currency forward contracts.

Course Contents: Topics covered in this course will include the following from the textbook.

- Interest Rate Measurement (Chap. 1)
- Valuation of Annuities (Chap. 2)
- Loan Repayment (Chap. 3)
- Bond Valuation (Chap. 4)
- Measuring the Rate of Return of an Investment (Chap. 5)
- The Term Structure of Interest Rates (Chap. 6)
- Cashflow Flow Duration and Immunization (Chap. 7)
- Forwards, Futures, Swaps, and Options (Chap. 9)

Since this course is intended to prepare students to pass SOA Exam FM, class meetings will be divided into part presentation of mathematical and financial topics (lecture) and part solving exercises similar to those students will face on SOA Exam FM (practice).

Attendance: Students are expected to attend all class meetings per the [University Approved Guidelines](#).

If you know beforehand that you will be absent from class on the day an assignment is due, you must complete and hand in the assignment prior to the absence. If you are unexpectedly absent the day that an assignment is due you must hand in the assignment at the beginning of the class hour on the first day that you return to class. If you know you will be absent on the day of a test, you must notify me before the time the test is scheduled in order to schedule a make-up test. Students who miss a test should provide a valid excuse, otherwise you will not be allowed to make up the test. No final exam exemptions.

Homework: Students are expected to do their homework and participate in class. Students should expect to spend a minimum of three hours outside of class on homework and review for every hour spent in class. Homework exercises help students review and reinforce concepts covered in class. The textbook exercises are arranged in generally increasing level of difficulty. Working only the low-numbered exercises will not prepare a student sufficiently for the test and final examination exercises. All assigned homework exercises must be worked until successful completion.

Tests: There will be three tests during the semester and a final examination,

Test #1	September 19, 2023 (Tuesday)
Test #2	October 19, 2023 (Thursday)
Test #3	November 21, 2023 (Tuesday)

The comprehensive final examination is scheduled for Wednesday, December 6, 2023 from 2:45P–4:45P. I will not “curve” test or exam grades. The question phrasing and format of the tests and final examination will mimic the format of SOA Exam FM.

Grades: Course grade will be calculated as follows.

Homework	40%
Tests	35%
Final Examination	25%

I keep a record of students’ test, homework, and exam scores. Students should also keep a record of graded assignments, tests, and other materials.

The course letter grade will be assigned as follows. I will not “curve” course grades.

90-92	A–	93-100	A	
80-82	B–	83-86	B	87-89 B+
70-72	C–	73-76	C	77-79 C+
60-62	D–	63-66	D	67-69 D+
		0-59	F	

Course Repeat Policy An undergraduate student may not take an undergraduate course of record more than [three times](#). A course of record is defined as a course in which a student receives a grade of A, B, C, D, (including + and –) F, U, Z or W. The academic department offering a course may drop a student from a course if the student attempts to take a course more than three times.

The last day to withdraw from a course (and receive the W grade) is October 27, 2023 at 4:30P. Course withdrawals are submitted online.

Inclement Weather Policy: If we should miss a class day due to a school [delay](#) or [cancellation](#), any activities planned for that missed day will take place the next time the class meets. For example, if a test is scheduled for a day that class is canceled on account of snow, the test will be given the next time the class meets.

Cell Phones: Silence (or better yet, turn off) all cellular telephones upon entering the classroom. Leaving class to initiate or receive a telephone call will not be tolerated and students doing so will not be re-admitted to the classroom until the following class meeting. Texting or tweeting during class interferes with the learning process. Students distracted by their cell phones are not engaged in class and will find, over the course of the semester, that learning and course grade will suffer.

Title IX Reporting Responsibilities: Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with requirements of Title IX of the Education Amendments of 1972, 20 U.S.C. §1681, *et seq.*, and the University's commitment to offering supportive measures in accordance with the new regulations issued under Title IX, the University requires faculty members to report to the University's Title IX Coordinator incidents of sexual violence shared by students. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report to the person designated in the University [Protection of Minors policy](#) sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred.

Information regarding the reporting of sexual violence, and the resources that are available to victims of sexual violence, is set forth at: <https://www.millersville.edu/titleix/>.

Academic Honesty: Students are required to avoid plagiarism, falsification of their work, cheating (including assisting others in cheating), and other forms of academic misconduct. For more information including definitions and examples of academic dishonesty, please see the [Academic Honesty Policy](#).

Land Acknowledgement: Millersville University would like to recognize the Native peoples of the lower Susquehanna River basin, those known and those unknown to us, who have stewarded the land, upon which Millersville University sits, for thousands of years. We acknowledge that the land on which we gather, study, and work is the ancestral land of the Conestogas, Susquehannocks, Shawnee, and others. One group, the Shenks Ferry people, had a village adjacent to the campus. We pay our respects to the traditional occupants and caretakers of this land.

Other University Policies: Students may wish to consult the links provided below outlining Millersville University's policies on:

- [Inclusivity](#)
- [Preferred names](#)
- [Student rights under FERPA](#)
- [Student conduct and community standards](#)

Final Word: Mathematics is not a spectator sport. What you learn from this course and your final grade depend mainly on the amount of work you put forth. Daily contact with the material through homework assignments and review of notes taken during lectures is extremely important. Organizing and conducting regular study sessions with other students in this class will help you to understand the material better.

No one can guarantee you success in this course. Your responsibilities and the instructor's expectation are outlined above. There will be no second chances, "do-overs", or extra credit assignments.