MATH 251
Introduction to Mathematics of Finance

Fall 2026

Instructor:

Associate Professor Siyang Tao, Ph.D., ASA

Office Hours: TR 10:40 am-11:30 am

Office: RB 429

765-285-8681

https://sites.google.com/view/siyangtao

tao@bsu.edu (the best way to contact me)

Course Info:

Prereq: C- or better in MATH 111 and MATH 112, or appropriate score on the SAT/ACT, or appropriate scores on the mathematics placement test, or permission of the department chairperson.

Weekly schedule

TR 12:00pm–12:50pm

RB 121

Department:

DEO: Professor Dan Rutherford

Phone: 765-285-8640

Office: RB 465

GA Info:

Mr. Braeden Oesterling

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Overview

This course sequence has two primary objectives. Part I is designed for students preparing for the interest theory portion of the Society of Actuaries (SOA) Financial Mathematics (FM) exam. It consists of a four-chapter introduction to FM:

Chapter 0. Mathematical Review (One week)
Chapter 1. The Measurement of Interest (Four weeks)
Chapter 2. Level Annuities (Four weeks)
Chapter 3. Varying Annuities (Three weeks)

Part II focuses on building your professional foundation as an actuary. To support this pilot component, I have invited Fellows of the Society of Actuaries (FSAs) to lead a series of workshops and presentations. Topics may include the Code of Professional Conduct, Actuarial Standards of Practice (ASOPs), mock interviews with alumni, and overviews of various actuarial career tracks.

Exam FM

Exam FM is a 2.5-hour computer-based testing (CBT) exam consisting of 30 multiple-choice questions. The learning outcomes state: *The goal of the syllabus for this examination is to provide an understanding of the fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated values for various streams of cash flows as a basis for future use in: reserving, valuation, pricing, asset/liability management, investment income, capital budgeting, and valuing contingent cash flows.* More information about Exam FM, including the full syllabus, can be found at the SOA website.

Recommended Texts / Study Material

Required Texts

There is no required textbook for this course. Our primary resource will be the comprehensive lecture notes available on Canvas. These notes cover all essential concepts for the SOA Exam FM and are designed to provide a deep understanding of the material. They also include numerous examples and practice problems to help you prepare for the exam. Additionally, I will provide printed copies of all necessary supplementary handouts in class.

Recommended Texts

- *ASM Study Manual for SOA Financial Mathematics (FM) Exam*
- *Broverman, S.A., 2017. Mathematics of Investment and Credit (8th Edition). ACTEX.*

Professionalism

- Weeks 1–4: Resume Preparation
  - Attend the in-class resume workshop (3% of total grade) and submit your resume. The initial submission is worth 3% of your total grade and is due by midnight on Thursday, September 3. The final resubmission is worth an additional 2% and is due by midnight on Wednesday, September 9. Please note that submissions failing to meet Lorrie's requirements will receive only partial credit.
  - The GIS will host four workshops: Researching Employers (August 27), Interview Prep (August 28), Resume Workshop (August 31), and an Excel/Email Signature Workshop (September 2). To maximize your preparation for internship week, you must attend at least one of the first two dates (3% of total grade) and at least one of the second two dates (3% of total grade). Attendance will be reported directly by the GIS officers.
- Weeks 2–5: Company Presentations and Professionalism Talks. Attend at least six company presentations and one in-class talk on professionalism. Attendance will be verified by GIS officers (21% of total grade; 3% per event).
- Actuarial Science Speaker Series. Your attendance and active engagement at this event will count toward your participation grade (5% of total grade).

Grading Scheme

15% Assignments: Bi-weekly assignments will be distributed every other Tuesday. You must submit your completed assignments two weeks later by noon on Tuesday. Solutions will be posted on the same day as the submission deadline. Your lowest homework score will be dropped when calculating your final grade.

A note on collaboration: While discussing homework problems with peers is encouraged, you must write up your solutions independently.

5% Participation: During the semester, the department will host an Actuarial Science Speaker Series (date and time TBA). Your attendance and active engagement at this event will count toward your participation grade.

35% Professionalism: You will be required to write a resume, participate in at least two GIS workshops, and attend two in-class presentations along with six invited talks led by actuarial experts.

15% Midterm Exam: A 50-minute, closed-book written midterm exam will be held in class (12:00 pm – 12:50 pm) on Thursday, November 5, 2026. It will primarily consist of computational questions styled after SOA Exam FM problems and lecture note exercises.

30% Final Exam: A comprehensive, two-hour, closed-book written examination will take place from 12:00 pm to 2:00 pm on Wednesday, December 9, 2026. Like the midterm, it will predominantly feature computational questions similar to SOA Exam FM problems and lecture note exercises.

This course utilizes a plus/minus grading system. Final grades will approximately follow the standard scale below:

A- [90, 93)	A [93, 100]	
B- [80, 83)	B [83, 87]	B+ [87, 90)
C- [70, 73)	C [73, 77]	C+ [77, 80)
D- [60, 63)	D [63, 67]	D+ [67, 70)
F [0, 60)		

Any curve applied to final grades is at the discretion of the instructor. All exams in this course are closed-book. Only calculators listed under Point 9 of the SOA exam rules and regulations (linked here) are permitted. The Texas Instruments BA II Plus Financial Calculator is highly recommended for both this course and Exam FM.

Late Policy

All assignments are due before class on Tuesdays. Late homework will not be accepted under any circumstances. Additionally, there are no make-up opportunities for attendance-based assignments; any missed attendance assignment will automatically result in a grade of zero.

Grading Policy

It is my policy that appropriate evaluation of your academic performance is an integral part of your learning experience. In the absence of mistake, fraud, bad faith or incompetence, I will be the key decision-maker on the assignment of grades. For information on grade appeal, consult the Ball State website.

Academic Integrity/Plagiarism Policy

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. Please review the University's Academic Integrity Policy.

For Ball State's policies on Academic Integrity, please see the Code of Student Rights and Responsibilities. In particular, the section on the Student Academic Ethics Policy.

Violations

Examples of academic integrity violations include but are not limited to:

- Sharing or allowing others to access your files, whether done with permission or not.
- Use or possession of a file created by someone else.
- Reusing work from another semester, course, or section.
- Fraudulent submission of work.
- Using unauthorized materials during Exams.
- Impersonating someone else or having them impersonate you.
- Making fraudulent or dishonest statements regarding your work.
- Soliciting others to complete work for you.
- Posting course files and resources on study or content sharing websites.
- The Plagiarism Tutorial from UNC Libraries (Links to an external site.) provides you with a great foundation in Academic Integrity.

Make-up Policy

If, for medical reasons, you are unable to take any exam in this course, you should inform the course instructor within 24 hours of the exam, and submit original documentation as soon as possible. Otherwise, a zero score will be awarded. Absence for other reasons will not be allowed, unless approval from the instructor is sought well in advance.

Attendance Policy

You are expected to attend every class session. If you miss a class, you are responsible for obtaining and reviewing any material covered during your absence.

Freedom of Expression

In this course, we are committed to fostering a learning environment that values intellectual diversity, encourages free expression, and promotes open inquiry. As members of the Ball State Community, we treat each person in the Ball State community with civility, courtesy, compassion, and dignity and respect and learn from differences in people, ideas, and opinions. Please review Ball State University's Statement on Freedom of Expression, the resources on Ball State's Freedom of Expression webpage, and Ball State's Beneficence Pledge.

Ball State University Disability Services Statement

If you need course adaptations or accommodations because of a disability, please contact me as soon as possible. Ball State's Disability Services office coordinates services for students with disabilities; documentation of a disability needs to be on file in that office before any accommodations can be provided. Disability Services can be contacted at 765-285-5293 or dsd@bsu.edu.

Ball State University Diversity Statement

Ball State University aspires to be a university that attracts and retains a diverse faculty, staff, and student body. We are committed to ensuring that all members of the community are welcome, through valuing the various experiences and world-views represented at Ball State and among those we serve. We promote a culture of respect and civil discourse as expressed in our Beneficence Pledgeand through university resources found at https://www.bsu.edu/campuslife/multicultural-center.

Canvas Accessibility Statement

Canvas provides a user experience that is easy, simple, and intuitive. Special attention has been paid to making Canvas screen-readable. The Rich Content Editor encourages users to create accessible content pages (i.e. text formatting is accomplished using styles). Canvas is designed to allow limited customization of colors and schemes to be accessible for all users. The National Federation of the Blind granted Canvas the Gold Level Web Certification in 2010.

Link to the Student Academic Ethics Policy

Student Academic Ethics Policy: here

Link to the Code of Student Rights and Responsibilities

Code of Student Rights and Responsibilities: here

Course Withdrawal Statement

The course withdrawal period ends Wednesday, October 28, 2026. Before this date, students can elect to receive a "W" for the course by completing and submitting the proper form. The instructor's permission is not required. For details, see this link as well as Degree Requirements and Time Limits in the current Undergraduate Catalog OR Withdrawal Procedures in the current graduate catalog.

Class Schedule

Week #	Dates	Plan	Tuesday	Thursday
Week 1	Aug. 24 – Aug. 28	Syllabus		Resume♢
Week 2	Aug. 31 – Sep. 4	Chapter 0	Professionalism♢	GIS♢
Week 3	Sep. 7 – Sep. 11	Chapter 1		
Week 4	Sep. 14 – Sep. 18	Chapter 1	Assignment 1	
Week 5	Sep. 21 – Sep. 25	Chapter 1		
Week 6	Sep. 28 – Oct. 2	Chapter 1	Assignment 2	
Week 7	Oct. 5 – Oct. 9	Chapter 2		
Week 8	Oct. 12 – Oct. 16	Chapter 2	♡	♠
Week 9	Oct. 19 – Oct. 23	Chapter 2	Assignment 3	
Week 10	Oct. 26 – Oct. 30	Chapter 2	Assignment 4	
Week 11	Nov. 2 – Nov. 6	Review		Midterm
Week 12	Nov. 9 – Nov. 13	Chapter 3		
Week 13	Nov. 16 – Nov. 20	Chapter 3	Assignment 5	
Week 14	Nov. 23 – Nov. 27	Chapter 3		♣
Week 15	Nov. 30 – Dec. 4	Review	Assignment 6	
Week 16	Dec. 7 – Dec. 11	FINAL EXAM (Wed.)		

♢ August 27, September 1, and September 3: In-class talks
♡ October 13: Fall Break — No class
♠ October 15: Instructor away — No class
♣ November 26: Thanksgiving Holiday — No class