

AS.110.276 section 88 Syllabus

Introduction to Financial Mathematics

Course Information

Expanded Course Description:

Course Description: This course is designed to develop students' understanding of fundamental concepts of financial mathematics. The course will cover mathematical theory and applications including the time value of money, annuities and cash flows, bond pricing, loans, amortization and stock pricing. A basic knowledge of calculus and an introductory knowledge of probability is assumed.

Course Information:

Introduction to Financial Mathematics

AS.110.276.88 (4.0 Credits)

Description

This course is designed to develop students' understanding of fundamental concepts of financial mathematics. The course will cover mathematical theory and applications including the time value of money, annuities and cash flows, bond pricing, loans, amortization, stock and portfolio pricing, immunization of portfolios, swaps and determinants of interest rates, asset matching and convexity. A basic knowledge of calculus and an introductory knowledge of probability is assumed.

Department: AS Mathematics

College: Krieger School of Arts and Sciences

Course Learning Outcomes

 Calculate present value, current value and accumulated value of contingent and non-contingent payments to understand the time value of money.

 Define and recognize the definitions of the following terms: principal, interest, inflation, term of loan, outstanding balance, final payment (drop payment, balloon payment), amortization.

 Calculate term of loan, interest rate, payment amount, payment period, principal and the outstanding balance at any point in time.

 Given sufficient partial information about the items listed below, calculate price, book value, amortization of premium, accumulation of discount, redemption value, face value, yield rate, coupon, coupon rate.

 Calculate: The dollar-weighted and time-weighted rate of return. The price of a stock using the dividend discount model

Required Text and Other Materials

Textbooks:

Textbook: **Interest Theory: Financial Mathematics and Deterministic Valuation & Video Library | 3rd Edition, 22nd**

Printing To rent the e-text, go to: <https://www.actexmadriver.com/OrderSelection.aspx?terms=>

Click here to view instructions on how to access the text

https://jhu.instructure.com/courses/71666/pages/notes-about-our-textbook?module_item_id=3807235

Other Required Materials:

Microsoft Excel is required.

Course Outline

Course Outline:

<https://jhu.instructure.com/courses/71666/modules>

Evaluation and Grading

Note that the final course syllabus may differ from the information below.

Grading Breakdown:

Grading Your final grade for the class will be given as a weighted average with the weights given as follows: - Discussion Forums: 10% (lowest grade dropped) - Homework (Blackboard): 10% (lowest grade dropped) - Homework (Excel submissions) 10% - Quizzes: 15% (lowest grade dropped) - Mid-term: 25% - Final exam: 30%

Grading Scale:

The letter grades are assigned as follows based on your final weighted average: A: 90-100 B: 80 - 89 C: 70 - 79 D: 60 - 69 F: < 60 "+" and "-" will be determined at the end of the semester.

Course Policies

Additional Course Policies:

Course Change and Refund Timelines:

<https://summer.jhu.edu/accepted-students/course-change-refund-timelines/>

Technology: Canvas will host the course website where you will find all learning materials for the course. There are excellent smartphone scanner apps that will convert photos of documents to high resolution PDFs (see e.g. <https://www.nytimes.com/wirecutter/reviews/best-mobile-scanning-apps/>) In the project work in the course you may be instructed to use Excel or google sheets, desmos.com, WolframAlpha or other tools and collaborate using shared documents or shared white boards. Please ask each other and the instructor for help if you are struggling to use any of these tools. Absences: Attendance at any live online sessions are optional. Lectures will be recorded and posted in the course for any students who cannot attend. Students who require classroom accommodations or other arrangements must make this known to their instructor as soon as possible at the beginning of the semester and be registered with Student Disability Services. Collaboration: Collaboration on homework is allowed and encouraged. However, each student must write up his/her solutions to the problems individually and in his/her own words - copying from another student's paper is prohibited. Homework is an essential part of learning the course material. Failing to give it proper attention will significantly harm your performance on the quizzes and your overall grade for the class. There is no collaboration on quizzes, midterm or final.



University Statement on Equal Opportunity

Johns Hopkins University is committed to equal opportunity for its faculty, staff, and students. To that end, the university does not discriminate on the basis of sex, gender, marital status, pregnancy, race, color, ethnicity, national origin, age, disability, religion, sexual orientation, gender identity or expression, veteran status or other legally protected characteristic.



Academic Integrity

The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition.

Report any violations you witness to the instructor. You may consult the associate dean of student conduct (or designee) by calling the Office of the Dean of Student Life at 410-516-8208 or via email at studentconduct@jhu.edu.



Students with Disabilities - Accommodations and Accessibility

Johns Hopkins University values diversity and inclusion. We are committed to providing welcoming, equitable, and accessible educational experiences for all students. Students with disabilities (including those with psychological conditions, medical conditions and temporary disabilities) can request accommodations for this course by providing an Accommodation Letter issued by Student Disability Services (SDS). Please request accommodations for this course as early as possible to provide time for effective communication and arrangements.

For further information or to start the process of requesting accommodations, please contact Student Disability Services at Homewood Campus, Shaffer Hall #101, call: 410-516-4720 and email: studentdisabilityservices@jhu.edu or visit the website

<https://studentaffairs.jhu.edu/disabilities/>



Inclusivity and Classroom Climate

Johns Hopkins University is committed to creating a classroom environment that values the diversity of experiences and perspectives that all students bring. Everyone on campus has the right to be treated with dignity and respect. JHU believes fostering an inclusive climate is important because research shows that students who interact with peers who are different from themselves learn new things and experience tangible educational outcomes.

Please help create a welcoming and vibrant classroom climate. You should expect to be challenged intellectually by instructors, the TAs, and your peers, and at times this may feel uncomfortable. Indeed, it can be helpful to be pushed sometimes in order to learn and grow. But at no time in this learning process should someone be singled out or treated unequally on the basis of any seen or unseen part of their identity.



Student Health and Wellness

<https://studentaffairs.jhu.edu/counselingcenter/>

The Counseling Center provides a safe, confidential, non-judgmental space where students can feel free to explore a wide variety of concerns and issues.

If you are struggling with anxiety, stress, depression or other mental health related concerns, please consider visiting the JHU Counseling Center. If you are concerned about a friend, please encourage that person to seek out their services

The Counseling Center offers a wide variety of services to assist students including drop-in hours, workshops, group therapy, brief individual therapy, couples counseling, psychiatric evaluations and medication management, substance use assessments, eating assessments, and 24/7 crisis intervention services.



Religious Holidays

Religious holidays are valid reasons to be excused from class. Students who must miss a class or an examination because of a religious holiday must inform the instructor as early in the semester as possible in order to be excused from class or to make up any work that is missed. If possible, instructors should try to avoid scheduling exams for major holidays. Below we list some of the major religious holidays and holy days that may overlap dates of instruction or exams of our students, faculty, and staff for Fall. Please note that this is not an all-encompassing list for every religious tradition.

A list of many religious holidays is maintained at <https://studentaffairs.jhu.edu/religious-spiritual-life/religious-holy-days/>

More information may be found at the Religious and Spiritual Life [website](#). If you have any questions regarding a particular case or would like any guidance, please do not hesitate to contact the Johns Hopkins University Chaplain at 410-516-1880 or kschnurr@jhu.edu. Thank you for your sensitivity to this matter.

Students may also request a religious accommodation through the Office of Institutional Equity at the website: <https://oie.jhu.edu/religious-accommodations/>.



Anxiety Stress and Mental Health

Anxiety, stress, and mental health

JHU has several resources to support students. At times during your college career, many students struggle with stress and even anxiety and depression. The Counseling Center has many resources available to students <https://studentaffairs.jhu.edu>

In addition, The Johns Hopkins University Behavioral Health Crisis Support Team (BHCST) pairs experienced, compassionate crisis clinicians with specially trained public safety officers on every shift on and around the Homewood campus, seven days a week. The BHCST will provide immediate assistance to those who need it and, just as importantly, link individuals in crisis to ongoing support services in the days and weeks that follow. Call Public Safety, 410-516-5600, and ask for a BHCST clinician.

If you have concerns about a specific student, please contact:

- For [emergencies](#) (threat to self or others): 410-516-4600 or 911
- For on-scene mental health support: BHCST at 410-516-4600

- For undergraduates: Student Outreach & Support at 410-516-7857 or studentoutreach@jhu.edu (undergraduates)



Family accommodation policy

You are welcome to bring a family member to class on occasional days when your responsibilities require it (for example, if emergency childcare is unavailable, or for the health needs of a relative). Please be sensitive to the classroom environment, and if your family member becomes uncomfortably disruptive, you may leave the classroom and return as needed.



Incomplete grades

The complete policies regarding incomplete grades are available here:

<https://e-catalogue.jhu.edu/engineering/full-time-residential-programs/graduate-policies/academic-policies/#courseinformationandacademicstext>

the following text is an excerpt:

1. A request for an Incomplete grade must be initiated by the student no later than the last day of classes via the Incomplete Grade Contract available in SIS
2. The required elements on the Incomplete Grade Contract are listed below; all of these topics should be included in the conversation between the student and the instructor.
 1. The reason for the request for an incomplete grade
 2. A description of all outstanding work that must be completed
 3. Date the work is due from the student
 4. The reversion grade if the student does not complete any of the outstanding work
3. Undergraduate Students: Instructors are required to submit the new grade to the Office of the Homewood Registrar no later than 45 calendar days after the last day of classes. If the Incomplete grade is not resolved within 45 calendar days after the last day of classes, the Incomplete grade is automatically converted to the reversion grade.
4. Graduate Students: If the incomplete grade is not resolved within the agreed period in the incomplete grade contract (which cannot exceed the maximum allowed period of the end of the third week of the next immediate semester), the incomplete grade is automatically converted to the reversion grade.

The significant change here is that there is an Incomplete Grade Contract available to students in SIS to request an incomplete grade. This is how all incomplete grades must be initiated now. The other significant change is the timeline for completion of an incomplete grade for undergraduate students, now set **at 45 calendar days after the last day of classes**. Formerly, the default deadline was the end of the third week of the following semester (and this remains the deadline for graduate students for the AY22-23). See the full catalogue entry for considerations for students on academic probation and graduating students.



Grades work before the drop deadline

The last day a student can drop a class is at the end of the sixth full week of classes. It is helpful to students to have a chance to review some graded work before that date so that they can make an informed judgment as to whether or not to drop a course. Specific information about drop dates is available on the registrar's web site: <https://studentaffairs.jhu.edu/registrar/academic-calendar/>



Administration of final examinations

For more information on final exams, please consult the final exam policy in the e-catalog:

<https://e-catalogue.jhu.edu/arts-sciences/full-time-residential-programs/undergraduate-policies/academic-policies/registration-policies/#examreadingperiodtext>

The Fall 2023 final exam schedule is available at the following link <https://studentaffairs.jhu.edu/registrar/> under Students --> Course Schedule.

Instructors are not permitted to make ad hoc arrangements for the administration of final examinations. Consistent with the recommendation made by the Commission on Undergraduate Education that the policies related to final examinations be reiterated each year, and with the concurrence of the Academic Council, we wish to call your attention to the following guidelines and urge your cooperation:

1. The times and places of final examinations are officially scheduled by the University Registrar. All final examinations are to be administered during the official final examination period at the time prescribed for the course in question. Students should not be polled as to their willingness to change the time of the scheduled examination. Exams scheduled outside the formal schedule inevitably conflict with other examinations or other obligations.
2. The reading period was established so that students could have several days free of other obligations in order to prepare for their examinations. Please keep those days clear for that purpose. No final examinations are to be administered during the reading period.
3. While faculty have the discretion to schedule quizzes, mid-term examinations, and hourly examinations (including tests that they may regard as comprehensive) during any class period of the regular semester, the practice of scheduling a formal final examination for the last class period violates both the letter and the spirit of the final examination policy. It compromises the length of the semester for instructional purposes and limits the ability of students to prepare adequately.
4. Any take-home final examination can be due **no earlier** than the time of the regularly scheduled final examination. Faculty members sometimes substitute other academic exercises for a final examination. When assigned as a final exercise, with the expectation that the student will prepare for the assignment and complete the assignment after classes have concluded, such substitutes for examinations should be treated as final examinations and be due on the course's scheduled examination date. While faculty members retain the discretion to assign appropriate due dates for papers and projects, it is inappropriate to structure a course so that assignments must be completed during the reading period.
5. If weather necessitates the cancellation of final examinations, make-up examinations must be administered only within the formal examination schedule.
6. Faculty members who have other imperative professional obligations that require some adjustment to the final examination schedule should confer no later than September 9, 2022, with the appropriate Vice Dean for Education, as appropriate.
7. Students find it extremely helpful when a course syllabus describes all the requirements for a course, including the date of the final examination and weight to be accorded it, in addition to the course description and goals, reading assignments, grading policies, contact information and office hours, and the ethics insert that we have recently suggested for inclusion. Please include this information in your syllabus.

These procedures are prescribed in the interest of fairness to students and an orderly and manageable final examination schedule.



Prompt submissions of grades

Late grades have implications for students' financial aid, academic standing, visa status, and graduation. Therefore, it is vital that faculty post their grades promptly. The expectation is that grades will be submitted within 48 hours of the administration of the scheduled final exam time/final project due date (if in lieu of a final exam, etc.). Online grade submission will be available beginning on or about the last day of classes.



Starfish for reporting student progress/difficulty

Starfish is a tool through which you can raise concerns about students experiencing academic or personal challenges. This is an early intervention system that connects the appropriate assigned staff members to a student of concern in order to provide support and resources. Once a connection is made to the student a faculty member can view comments in Starfish to learn if the challenge has been addressed and/or resolved. It is also now the method by which we collect mid-semester reports for undergraduate students. You can access Starfish through Canvas or SIS (when in "advisor" mode) you can also use the Starfish link: <https://t.jh.edu/starfish>. For general Starfish help and resources for faculty go to: <https://uis.jhu.edu/starfish/>. Please contact Sloane Hanley at SloaneH@jhu.edu or Ruth Sherman at rsherm11@jhu.edu if you have additional questions.



Student illness and class attendance

Class attendance is a student responsibility and is expected of all JHU undergraduate students. Occasionally, health, family or personal matters may interfere with their ability to attend class. In this situation, the student is expected to notify their professors as soon as you're able about missing class and discuss how to make up missed class time or assignments. It is the professor's responsibility to create a policy on how to handle these situations, this should be outlined in the syllabus.



Covid-19 specific guidelines

General information about COVID-19 related policies at the university can be found at this site: <https://covidinfo.jhu.edu/> The university has instituted COVID-19 vaccination requirements for our community. At present there is no indoor masking requirement or testing requirement of faculty, staff, or students. We remind you that: Instructors may not:

- Ask the vaccination status of any other JHU affiliate.
- Be notified of which JHU affiliates are unvaccinated.
- Create class-specific policies regarding masking and/or vaccination status.

As public health considerations, legal considerations, state, and local mandates evolve, the university is responding to these changes while, at all times, focusing on ensuring that we are in compliance with requirements and are doing all we can to protect the health and safety of our community. At the same time, we also are committed to advancing our mission by providing an education of the highest quality and creating knowledge for the benefit of the world. We will continue to update you with the latest information, including providing answers to any questions you have, and greatly appreciate your patience and understanding as we navigate all of this in a careful and thoughtful manner.

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