Year 2014-15

Mathematics for Finance (20644)

Degree/study: Grau Economia i ADE
Course: third/fourth
Term: first
Number of ECTS credits: 5 credits
Hours of student's dedication: 125 hours
Language or languages of instruction: English
Professor: Roland Umlauft

1. Presentation of the subject

This course is designed so that the student understands the two main concepts of financial mathematics, namely, discounting and accumulation, as well as various interest or time value mechanisms. The student obtains in-depth knowledge of calculation of the value of annuities and perpetuities with constant or varying payments. Finally, this knowledge is applied to the concepts of loans, debts and bonds as well as NPV, IRR and APR calculations.

2. Competences to be attained

Students obtain knowledge about discounting and accumulation using different interest rate regimes as well as calculation of the value of income streams. Throughout the course students make use of mathematical concepts such as progressions, logarithms and linear interpolation.

3. Contents

6 Chapters

1 – Simple Interest
2 – Compound Interest
3 – Annuities & Perpetuities
4 – Loans
5 – NPV, IRR, Depreciation
6 – Bonds

4. Assessment

This course consists of 30 hours of theory class (20 lectures of 1.5hrs) and 9 hours of practice classes (1.5hrs/wk during the last 6 weeks). At the end of the course there will be a final exam (75% of the grade). Additionally, students are graded on attendance and class participation, especially during the practice sessions (10%). Students have to hand in 3 homework sets. These homework sets account for 15% of the final grade.

Practice sessions are used to solve problem sets with active student involvement.

The minimum final passing grade is 5.0 out of 10. To pass, a minimum grade of 5.0 is required in the exam portion of the grade as well as 5.0 in the attendance/homework portion.

The grades for class participation and homework are preserved for the recuperation exam at the beginning of the 2nd trimester.

Students are only allowed to attend the exam or recuperation exam if they were enrolled in the course during the first term of 2014-15.

For students unable to attend the recuperation exam due to exchange study placement in the second term, an extra recuperation exam date can be set at the end of the 3rd term.

5. Bibliography and teaching resources

5.1. Basic bibliography

Zima, Brown, Kopp, Mathematics of Finance, 7th Edition, McGraw Hill. 2011

5.2. Additional bibliography

MINER, J. Curso de Matemàtica financiera. McGraw Hill. Madrid, 2003.

BRUN, X., ELVIRA, O., PUIG, X. Matemàtica financiera y estadística bàsica. Ed.Profit. Barcelona, 2008.

BONILLA, M.; IVARS, A. Matemática de las operaciones financieras (teoría y práctica). Madrid: AC, 1994.

DELGADO, C.; PALOMERO, J. Matemática financiera. 6a. ed. Logronyo: Distribuciones Texto S.A., 1995.

GIL PELÁEZ, L. Matemática de las operaciones financieras. Madrid: AC, 1987.

MENEU, V.; JORDÁ, M. P.; BARREIRA, M. T. Operaciones financieras en el mercado español. Barcelona: Ariel, 1994.

RODRÍGUEZ, A. Matemáticas de la financiación. Barcelona: Ediciones S, 1994.

SANOU, L.; VILLAZÓN, C. Matemática financiera. Barcelona: Foro Científico, 1993.

TERCEÑO, A. i d'altres. Matemática financiera. Madrid: Pirámide, 1997.

VILLAZÓN, C.; SANOU, L. Matemática financiera. Barcelona: Foro Científico, 1993

ALEGRE, P.; BADÍA, C.; BORRELL, M.; SANCHO, T. Ejercicios resueltos de matemática de las operaciones financieras. Madrid: AC, 1989.

CABELLO, J. M.; GÓMEZ, T.; RUIZ, F.; RODRÍGUEZ, R.; TORRICO, A. Matemáticas financieras aplicadas (127 problemas resueltos). Madrid: AC, 1999.

GIL PELÁEZ, L.; BAQUERO, M. J.; GIL, M. A.; MAESTRO, M. L. Matemática de las operaciones financieras. Problemas resueltos. Madrid: AC, 1989.

6. Methodology

During the lecture portion of the course, the theoretical foundation of financial mathematics will be presented and each new concept is illustrated by at least one example that is being solved by the lecturer. During seminar class examples, the concepts previously studied in lectures are used by students to present solutions to practice problems.

7. Activities Planning

Students are recommended to attend lectures and classes and to prepare solutions to the seminar practice problems before attending seminar classes, even though the solutions do not have to be handed in. There are 3 homework sets to be handed in groups of 2, at the beginning of theory class on the 3rd Nov, 17th Nov and 1st Dec.

Date	Wk	Chapter	Seminar	Homework
39-Sep	2	Intro&Ch1		
30-Sep		Ch1& Ch2		
6-Oct	3	Ch2		
7-Oct		Ch2		
13-Oct	4	Ch2		
14-Oct		Ch3		
20-Oct	5	Ch3		
21-Oct		Ch3		
22-Oct			Sem1	
27-Oct	6	Ch3		
28-Oct		Ch3&Ch4		
29-Oct			Sem2	
3-Nov	7	Ch4		PS1
4-Nov		Ch4		
5-Nov			Sem3	
10-Nov	8	Ch5		
11-Nov		Ch5		
12-Nov			Sem4	
17-Nov	9	Ch5 & Ch6		PS2
18-Nov		Ch6		
19-Nov			Sem5	
24-Nov	10	Ch6		
25-Nov		Ch6		
26-Nov			Sem6	
1-Dec	11	Ch6		PS3
2-Dec		Course review, practice exam		