Quantitative Finance
Degree on Economics, Finance and Management - 1st year, 2018/19

Lecturers:

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Aims:

- To develop the student's understanding of basic concepts and terminology of financial mathematics;
- To enhance the students ability to solve practical problems; and
- To understand the financial mathematical concepts necessary for other courses dealing with finance, insurance and investments.

1 Programme

1. Simple interest
   - 1.1 Types of time and interest
   - 1.2 Future value at simple interest
   - 1.3 Present value at simple interest
   - 1.4 Simple interest debt instruments
   - 1.5 Equation of value
   - 1.6 Equivalent time
2. Discount interest
   - 2.1 Comparing simple and discount interest
   - 2.2 Discount applications - Treasury Bills
3. Compound Interest
   - 3.1 Compound interest - Future Value Formula
   - 3.2 Nominal rates and effective interest
   - 3.3 Finding the compound Rate
   - 3.4 Finding the time for an investment to grow
   - 3.5 Equations of value to find the unknown
   - 3.6 Continuous compounding
4. Ordinary Annuities
   - 4.1 The future value of an ordinary annuity

4.2 The present value of an ordinary annuity

4.3 The periodic payment (or Rent) for an ordinary annuity

5. Other annuities certain

5.1 Deferred annuities

5.1 Perpetuities

6. Variable payment annuities

6.1 Arithmetic

6.2 Geometric

7. Amortisation of Debts and Amortisation Schedules

8. Investing in bonds

9. Leasing

10. Shares valuation

References

Guthrie, Gary C. & Lemon, Larry D. (2014). *Mathematics of Interest Rates and Finance*, Pearson, London.

Broverman, S.A. (2008). *Mathematics of Investment and Credit*, ACTEX Academic Series, ACTEX Publications Inc., Winsted, Connecticut, USA.

Barroso, M. N.; Couto E. & Crespo, N. (2009). *Cálculo e Instrumentos Financeiros*, Escolar Editora, Lisboa.

2 Assessment

Options: Either **2 Intermediate Tests** (50% each) or **Final Exam** (100%).

Intermediate tests are optional:

- 1st test at the midterm week;
- 2nd test at the same date and time of the Final Exam.

Final Exam: For everyone, except those who decide to sit the 2nd intermediate test.

Resit or Repeat Exam: For those who fail either the Intermediate Tests or the Final Exam. Also for those who wish to increase their mark.

Formula Sheet: All tests/exams are written and are carried out without consultation. Students are allowed to use a Formula Sheet provided by the Lecturer. The students should print them and take to the tests/exams. Absolutely no extra writing is allowed.

Graphical calculators or calculators with memory are not allowed during the exam or test.