Teaching Plan

1. Subject data

- **Name: Mathematics III**
- **Course: 2012-13**
- **Year: 1st**
- **Term: 3rd**
- **Degree: IBE**
- **Subject code: 21127**
- **Credit number (ECTS): 5**
- **Student workload: 125**
- **Teaching language: English**
- **Lecturers: Pelegrí Viader (plenary sessions); Javier Vicente (seminars).**

2. The subject

Mathematics III is a basic training subject for the student and focuses on those mathematical techniques that are most needed in economic analysis.

It is the last of a sequence of three subjects in the junior year. After getting familiar with the mathematical language, the student begins using it to tackle real problems of a greater degree of complexity.

During the course, the optimization concepts that have already been introduced in "Mathematics II" in the case of 2 variables are now revised and applied to problems which are closer to real economics where the number of variables is usually high. On the other hand, difference equations and differential equations are introduced anew and used to model mathematically economic reality.

3. Competences to be acquired

General competences	Specific competences
Instrumental 1. Analysis and synthesis. 2. Organization and planning 3. Basic general knowledge 4. Problem solving 5. Oral and written skills. **Interpersonal** 6. Analysis capacity. **Systemic** 7. Research skills 8. Learning capacity 9. Autonomous work 10. Creativity **Other** 11. Oral and written skills in a specialized language	1. Modeling through mathematical language 2. Solving mathematical problems 3.Acquiring and applying optimization techniques in n variables and the use of difference equations and differential equations:

4.Contents

Block 1. Matrix diagonalization

Block 2. Multivariate optimization

Block 3. Prerequisites for the study of difference equations and differential equations: trigonometric functions and integration by parts.

Block 4. Difference equations of order 1.

Block 5. Difference equations of order 2.

Block 6. Differential equations of order 1.

Block 7. Differential equations of order 2.

5. Grading policy

The grades for the course will be obtained as follows:

Course work:	
Homework + attendance to the SRP	8%
Three tests (2×8%)	24%
Participation in class and SRP	8%
Exam:	
Final exam	60%
Total	100%

Extra Assignment (compulsory to get Honours): +0.5 points on the final passing grade for the course. In case of failing, the extra assignment grade will be kept for the retake exam.

In order to pass the course, the minimum grade is a total of 5 out of 10 (i.e. 50%) with the additional condition of getting at least a grade 4 out of 10 in the final exam. For instance, a grade of 3.4 out of 10 in the final exam will not be a pass even though the total grade exceeds 5/10. With a grade of 4/10 in the final exam, at least a 6.5/10 in the SRP/homework/tests will be needed to pass: $0.6 \times (4/10) + 0.4 \times (6.5/10) = 5/10$.

Retake

Failing students may retake the final exam with the same conditions as before.

Important remark. The retake exam will only be an option for those failing students that have attended at least to 6 of the 8 SRP and have sat the final exam. Students with poor attendance to the SRP (less that 6) or that do not sit the final exam will be graded as NOT PRESENT.

6. References and other sources

Basic reference (textbook)

SYDSAETER, K.; HAMMOND, P. J. Mathematics for Economic Analysis: Prentice Hall, 1995

Spanish translation:
SYDSAETER, K.; HAMMOND, P. J. Matemáticas para el análisis económico. Madrid: Prentice Hall, 1996

Complemetary bibliography

BORRELL, J. Métodos matemáticos para la economía. Programación matemática. Madrid:Pirámide,1992.
HERAS, A. and altri. Programación matemática y modelos económicos: un enfoque teórico-práctico. Madrid: AC, 1990.

Other sources:

Class notes and problem list in Aula Global.

7. Methodology

A student ought to carry out the following weekly work plan:

BEFORE the plenary session: reading of the class notes (personal work).
Attendance to the plenary sessions.
Personal study of solved problems, notes revising, textbook reading
BEFORE the SRP. Working out the problem list (personal work).
Attendance to the SRP.
Review and check the personal work on the problem list against the published solutions (personal work).

8. Activities program

There are no SRP during the first two weeks of the term. For the rest of the term the schedule will be:

Week	*Classroom activity*	*Homework* *Group work / activity*
Week x	Session 1 Plenary lesson (whole group) Session 2 T Plenary lesson (whole group)	- Reading of the class notes (personal work) - Reading of the class notes (personal work) - Personal study. Review of solved problems, notes revision, textbook reading (personal work). - Working out the problem list (personal work).

	Session 3 Problem seminar (SRP) (subgroups)	- Checking of the personal work on the problem list against the published solutions (personal work).

In Aula Global there will be found a complete description of the contents of each plenary session and each SRP.

SRPs calendar: Wednesday 17-24 April, 8-15-22-29 May, 5-12 June

Midterms will take place on Seminars 4 (15 May) and 7 (5 June). The contents of the tests will be the three previous seminars: Test 1 (SRP 1,2,3); Test 2 (SRP 4,5,6).