Teaching Plan

1. Subject data

- **Name: Mathematics III**
- **Course: 2014-15**
- **Year: 1st**
- **Term: 3rd**
- **Degree: IBE**
- **Subject code: 21127**
- **Credit number (ECTS): 5**
- **Student workload: 125**
- **Teaching language: English**
- **Lecturers: Mihalis G. Markakis (mihalis.markakis@upf.edu) - Alberto Fernandez (alberto.fernandezb@upf.edu)**

2. The subject

"Mathematics" is a sequence of courses in the first year of the IBE undergraduate degree, and aims to familiarize students with mathematical concepts and techniques that are most needed in economics and management.

"Mathematics III" is the last course of this sequence. During this course, optimization concepts that have already been introduced in "Mathematics II" in two variables are now revisited and extended to multiple variables, enabling students to tackle real-world problems. Moreover, the course introduces students to difference and differential equations, which are also used frequently in mathematical modeling of economic and business 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 algebra

Block 2: Optimization with equality and inequality constraints

Block 3: Trigonometric functions and theory of Integration

Block 4: Difference equations of first and second order

Block 5: Differential equations of first and second order

5. Grading policy

The final grade of the course will be obtained as follows:

Course work:

Homework and attendance in Seminars	4%
Two tests (2×14%)	28%
Blackboard participation	8%

Exam:

Final exam	60%

In order to pass the course a minimum grade of 5 out of 10 is required, with the additional constraint of getting at least 4 out of 10 in the final exam. If the grade in the final exam is less than 4 out of 10, then the final grade is by definition equal to the grade of the final exam (and, thus, the student fails the course automatically).

Recuperation Exam

Students that fail the course may retake the final exam with the same conditions as before. The recuperation exam will only be allowed to students that have attended at least **6 of the 8 Seminars** and have taken the **original final exam.**

Voluntary Work

If the student chooses to carry out voluntary work, then a bonus of **up to 0.5 points** will be added to the final grade (as long as the student has a passing grade). This also applies to the recuperation exam.

6. References

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

Other sources: Class notes and collection of solved problem at Aula Global.

7. Methodology

The following weekly work plan is suggested:

BEFORE each theory lecture: read the related class notes.
Attend theory lectures.
Read textbook, revisit class notes, study related solved problems.
BEFORE each Seminar: Work out the weekly homework.
Attend the Seminar.
Review and compare your solutions to the weekly homework against the published solutions.

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: Theory lecture (whole group) Session 2: Theory lecture (whole group) Session 3: Seminar (subgroups)	- Reading of class notes (personal work) - Review of solved problems, notes revision, textbook reading (personal work). - Working out the problem list (personal work). - Checking of the personal work on the problem list against the published solutions (personal work).

Seminar Schedule: April 22, 29 - May 6, 13, 20, 27 – June 3, 10.

Tests will take place during Seminars # 4 (May 13) and # 7 (June 3). Each test will cover the three previous seminars, i.e., Test 1 will cover Seminars 1, 2, and 3 - Test 2 will cover Seminars 4, 5, and 6.