Teaching Plan

1. Course description

- **Name of course:** Mathematics II
- **Academic year:** 2013-14 **Study year:** 1st **Trimester:** 2nd
- **Degree:** IBE
- **Course code:** 21124
- **Number of ECTS credits:** 5
- **Hours of dedication by student:** 125
- **Language of instruction:** English
- **Professors:** Michail Markakis

2. Presentation of the course

Mathematics II is the second in a sequence of three mathematics courses to be taken during the first year of studies in economics and business. Having been introduced to mathematical calculus as well as the basic concepts of optimization of a function of a single variable in Mathematics I, students will now extend these ideas to functions of two variables. The particular properties of two-variable functions will be treated, as well as the theory and practice of finding their optimum values, either maxima or minima as the case may be. Furthermore, optimization of such functions with equality or inequality constraints is treated. Thus, this course provides the basic mathematical tools for obtaining optimal values of economic functions, which is a fundamental objective in economics and business practice and research.

3. Competences to be acquired

General Competences	Specific Competences
Instrumental 1. Ability to analyze and synthesize 2. Ability to organize and plan 3. General basic knowledge 4. Problem solving 5. Written and spoken capabilities **Interpersonal** 6. Criticism. **Systemic** 7. Research abilities 8. Learning capacities 9. Autonomous work 10. Ability to generate new ideas (creativity) **Other** 11. Written and oral communication skills	1. Knowledge and applications of basic tools in mathematical analysis and linear algebra. 2. Problem formalization for different economics and business contexts through mathematical language. 3. Solutions of optimization problems for functions of two variables.

4. Content

- **Block 1:** Vectors, lines and planes in 3D-space.
- **Block 2**: Functions of two real variables
- **Block 2:** Implicit functions and gradients
- **Block 3:** Unconstrained optimization of two-variable functions
- **Block 5:** Optimization with inequality constraints
- **Block 6:** Optimization with inequality constraints: linear programming

5. Assessment

The grading of the subject is based on these three points:

1) Tests carried out during the Problem Solving Seminars (SRPs): two 30-minute long tests will be carried out during two of the SRPs [test 1: SRP #4, week 10-14 February, 2014; test 2: SRP #7, week 3-7 March 2014]. Each of these tests will consist of one or more problems, similar to the ones worked in the former sessions of the seminar. Each of the tests will account for 12% of the final grade.

2) Grading of the SRPs. The attendance of the student to the sessions and the quality of the submitted homework will be graded. All in all, the different grades given will be for:

   a. Attendance and homework: 8% (it is obviously meant that the student attends and hands in his/her personal homework (to the best of his/her ability).

   b. Problem solving at the blackboard and participation in the SRP: 8%.

3) Final Exam. A two-hour examination that includes all the contents of the course. It will provide a 60% of the final grade.

   - In order to get a Pass in the course, a minimum of 4 points out of 10 will be required in the final examination. In case a grade less than 4 is obtained in the final examination, the final grade will be the minimum between 4 and the grade obtained by working out the average.
   - Class participation and the overall understanding of the material, as reflected in the final exam, will be taken into account in order to potentially improve the characterization of the final grade, e.g., from "Excel.lent" to "MH".
   - In case of failing the course, there will be a makeup exam on **Saturday April 26th or May 3rd 2014**, and the new course grade will be calculated with the same percentages and conditions as before (with at least a grade of 4, the exam grade will be the 60 % of the final grade and 40 % will come from the course continuous assessment). The extra work will also be taken into account after obtaining a pass. **Students that miss more than two SRPs without being formally excused will not be allowed to take the makeup exam.**

6. Bibliography and teaching resources

Textbook: Sydsaeter & Hammond *Mathematics for Economic Analysis*. Prentice-Hall, 1995

Material at ``Aula Global'':

- Weekly Guides of theory.
- List of solved problems.
- Homework that has to be handed in at the following SRP.

6. Methodology

Students are supposed to do the following weekly assignments:

- Individual reading of the scripts or textbook sections before the theory sessions
- Attending theory sessions
- Personal study, solving homework problems, careful reading of the text book
- Bringing completed homework to SRPs
- Attending SRPs and being prepared to present the solutions of the homework problems, or similar problems, to the class

7. Activities timetable

Except for the two first weeks when there will be no seminars, activities will be as follows:

Week	*In class activities*	*Out of class activities*
Week X	Session 1: Theory (whole group) Session 2: Theory (whole group)	– Individual reading of the scripts/book sections before the theoretical sessions - Personal study, solving homework problems, careful reading of the textbook.
	Session 3: Seminars for solving problems (subgroups) – in two of these seminars 30-minute tests will be conducted which count towards the final grade.	

A more detailed description of the contents of each session can be found in *Aula Global* as the course progresses.