Mathematics I

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Content

Agenda

Contact information

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Agenda

Evaluation criteria

Criterion	Value
Homework	30%
Midterm exam	25%
Final exam	25%
Project	20%
Total	100%

Important remarks:

70% of the activities and homework must be delivered in order to present the second opportunity.

Your grade for the second opportunity will be computed as follows:

- 30% of the final grade obtained from the homeworks, exams, and project during the semester;
- 70% of the grade obtined with the extra-ordinary exam.

Agenda

Weekly schedule

Week Number	Topics	Chapter	Section(s)
1	Introduction to Calculus	1 & 2	1.1-1.3 2.1-2.5
2	Neighborhood of a point	3	3.1-3.2
3	Finite and infinite limits Limits of sum, product, quotient	3	3.3-3.8
4	Limits of composite functions Left and right hand limits	3	3.9-3.10
5	Derivatives Left and right hand derivative	4	4.1-4.4
6 - Activity 1	Derivatives of sum, product, quotient Derivatives of composite functions	4	4.5-4.7
7	Derivatives of transcendental functions	5	5.1-5.6
	MidTerm Exam		
10	Differentiation techniques	6	6.1-6.2
11	Differentiation and rate of change	7	7.1-7.3
12	Study of functions	8	8.1-8.4
13 - Activity 2	Application to optimization	9	9.1-9.3
14	Functions of multiple variables	10	10.1-10.3
15 - Activity 3	Differential of a function Directional derivatives Implicit functions	10	10.4-10.7
16	The gradient Lagrangian relaxation	10	10.8-10.9
	Final Exam		

Final Project

- The final project must be delivered before the final exam
- The project must be done in team of exactly 5 members
- The team will have to study an engineering case related to their educational program.
- The team should deliver a report in pdf format using LaTeX and a 5 minutes video
- The team may show to the teacher their work during the semester for feedbacks

Suggestions for the Final Project

- Gradient descent method and applications
- Polynomial regression
- Mathematics of neural networks
- Numerical solution of differential equations (e.g., Euler method, Runge-Kutta method)
- Approximation methods for transcendental function computation
- Non-linear optimization and applications
- Mathematics for computer graphics and animation