SUBJECT PROGRAM

I. SUBJECT IDENTIFICATION.

Subject: Mathematics II		Acronym: MAT 022	Approval date 03/12/2013		
UTFSM Credits: 5	Prerequisites: MAT 021	Exam: Does not have	Faculty.		
SCT Credits: 7			Mathematics Department		
Weekly Lecture Hours: 6	Weekly Assistantship Hours: 1.5	Weekly Laboratory Hours: 0	Semester in which it is taught		
			Odd	Even	Both X
Formative axis: Basic Engineering Sciences					
Total time dedicated to the subject: 221.5 hours.					

Subject Description

Basic practical theoretical subject that provides the fundamental concepts of integral calculus, series, matrix and vector algebra and basic notions of finite-dimensional spaces with applications towards the mathematical modeling of some real-world phenomena.

Entry requirements

- Capacity for logical reasoning, abstraction, and generalization, expressed through rigorous and precise mathematical language.
- Knowledge of the fundamental concepts and results of the differential calculus of real functions of a real variable.
- Application of concepts and techniques to solve various problems in various areas that may require differential calculus in a real variable.

Contribution to the graduation profile

SPECIFIC COMPETENCES

Apply the mathematical knowledge of integral calculus in a variable, systems of linear equations, sequences, and series in the formulation of simple scientific and technological problems and in the search for their respective alternative solutions.

GENERAL/TRANSVERSAL//DISTINCTIVE COMPETENCES

Develop skills to solve mathematical problems in the search for solutions to real problems in interdisciplinary work contexts.

Learning Results that are expected to be achieved in this subject.

1. Use the fundamental concepts and results of integral calculus for functions of a real variable.
2. Solve real problems in diverse disciplinary contexts that involve the approach of integrals.
3. Analyze the convergence of sequences and series and operate with them.
4. Use matrices to solve linear problems from various fields of engineering, mathematics, or physics.
5. Handle the main concepts of linear algebra and the geometry of R^2 and R^3.
6. Classify conics and quadrics and find their notable elements.

Thematic contents

1.The integral.
2. Geometric and physical applications.
3. Special coordinates.
4. Sequences and series.
5. Linear equations systems.
6. Vector algebra.
7. Notions of finite dimensional vector spaces.
8. Conical sections.

Teaching and learning methodology.

- Expository classes combined with cooperative learning techniques.
- Experimentation with short teaching-learning cycles.
- Exercise guides with notes from the Mathematics Department and use of appropriate software.

Evaluation and grading of the subject. (Adjusted to Institutional Regulations-Regulation No. 1)

Approval requirements and qualification	Exams (3), Controls (6) **Notation:** Presentation Note (NP), Contest Note 1 (C1), Contest Note 2 (C2), Contest Note 3 (C3), Global Contest Note (E), Average Controls Note (the five with the best grades) (PC) , Final Note of the course (NF). We calculate: NP=0.20*C1+0.25*C2+0.30*C3+0.25*PC • If NP>=55 or if NP<45, then NF=NP. • If 45<=NP<55, then the student must take the Global Competition and it is calculated NF=0.7*NP+0.3*E

Resources for learning.

Bibliography:

Guide Text	STEIN, S., BARCELLOS, A. “Calculus and Analytical Geometry”, MC Graw-Hill Publishing House 1995. E. KREYSZIG. “Advanced mathematics for engineering. Volume I and II”, Editorial Limusa, 1994.
Complementary or Optional	STEWART, J. “CALCULUS”, Grupo Editorial Iberoamerica, 1994.

II. CALCULATION OF NUMBER OF HOURS OF DEDICATION - (SCT-Chile) - SUBJECT SUMMARY TABLE.

ACTIVITY	Number of hours of dedication		
	Number of hours by	Number of Total	number of weeks weeks hours
PRESENCE			
Lecture or theoretical classes	6	17	102
Assistantship/Exercises	1.5	17	25.5
Industrial visits (Field)			
Laboratories / Workshop			
Evaluations (exams, others)	1.5	3	4.5
Other (Specify) Controls	0.75	6	4.5
NO PRESENCE			
Assistantship			
Mandatory tasks			
Personal Study (Individual or group)	5	17	85
Others (specify)			
TOTAL (HOURS)			221.5
Total number of TRANSFERABLE CREDITS			7