MATHEMATICS, EXTENDED COURSE

1.1. Identification

University:	Kungliga Tekniska Högskolan (Stockholm)													
School:	School of Chemical, Science and Technology													
Course:	Mathematics, extended course													
ECTS:	7.5													
Semester:	*Winter*							*Summer*						X
Category	*Fundamental course*					X		*Specialisation course*						
Module	*MFI*		*MFII*	X	*MFIII*			*MSI*		*MSII*		*MSIII*		
Teachers:	Kirsti Mattila													
Language:	*English*		*Italian*				*Swedish*	X	*Spanish*					

1.2. Learning-outcomes

- knowledge about the mathematical fundaments necessary for the design of performing materials and industrial chemical processes more economical and environmentally-friendly.

1.3. Competencies

- **General**
  - to have critical understanding of technical and scientific tools
  - to work and manage teams
  - communication skills (both written and oral)
  - to work in an international context

- **Specific**
  - To acquire knowledge on intermediate differential equations and transforms, and elements of complex analysis.
  - to use more advanced analytical methods that are useful in science and technology.

1.4. Contents

Ordinary differential equations, the Laplace transform. Series solutions, boundary value problems, orthogonality, Sturm-Liouville theory. Fourier analysis. Vector analysis. Partial differential equations. Complex analysis. Residue calculus. Conformal mappings.

1.5. Teaching Methodology

- Lecture sessions
- Practical sessions: “cooperative work” for solving problems

1.6. Evaluation

- written exams
- oral evaluation of the problems solved by “cooperative work”

1.7. Bibliography

- Kreyzig: Advanced Engineering Mathematics.