

Faculty	Ingegneria
Bachelor	Mechanical Engineering (La Spezia)
Year/Semester	2/1

Course Title	Mathematical analysis 2 and Mathematical Physics
ID Course Code	60237
Course Credits (CFU)	12
Scientific-Disciplinary Sector	Mat/05 & Mat/07
Course Type	Lessons and tutorials
Lecturer-in-charge	Marco Baronti & Franco Bampi

Learning Outcomes:

The main objective of the course is to provide students tools for differential and integral calculus and methods for numerical integration for Cauchy problems and for definite integrals.

Course Organisation Details

Double and triple integrals; changes of variable in multiple integrals: polar, cylindrical, spherical coordinates. Rotations and expansions. Curvilinear integrals of scalar functions. Length of a curve, Gauss-Green formulas. Surfaces, surface area, surface integrals. System of linear differential equations, Cauchy problem, numerical methods. Vector calculus. Kinematics, relative kinematics, dynamics and statics of particles. Cardinal equations. Center of mass. Conservation laws. Energy theorem. Mechanics of rigid bodies. Rigid body with a fixed axis. Rigid body with a fixed point: Poinsot motions. Unconstrained rigid body.

Assessment	hours
Lectures	64
Practice	32
Laboratory	
Integrative activities	

References

Fusco N., Marcellini P., Sbordone C., *Analisi Matematica 2*, Liguori, 1996;
 Parodi F., Appunti sulle serie
 Zolezzi T., *Analisi Matematica e calcolo numerico*, CLU, Genova

Organization and examinations

Lessons and tutorials in classroom.
 Written and oral examination

Pre-requisites

Mathematical Analysis I