SSM
Scuola Superiore Meridionale

Course title:

Differential Geometry

Duration [number of hours]**: 24**

PhD Program [MERC/MPS/SPACE]**: MPHS**

Name and Contact details of unit organizer(s):

Dr. Alessandro Zampini
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Course Description [max 150 words]**:**

The aim of the course is to describe some aspect of classical mechanics within the framework of differential geometry.

Syllabus [itemized list of course topics]**:**

Smooth manifolds; Vector fields and differential forms, the exterior Cartan calculus; Lie groups and Lie algebras; Metric structures on a manifold; Vector bundles, Connections and Curvature; Lagrangian and Hamiltonian formalism, Noether theorem, Hamilton-Jacobi equations

Assessment [form of assessment, e.g., final written/oral exam, solutions of problems during the course, final project to be handed-in, etc.]**:**

The exam will consist in delivering a seminar on an advanced topic within differential geometry.

Suggested reading and online resources:

1. G. Rudolph, M. Schmidt, "Differential Geometry and Mathematical Physics I, II" -- Springer 2013
2. I. Kolar, P. Michor, J. Slovak, "Natural Operations in Differential Geometry" – Springer 1993
3. J. Lee, "Introduction to Smooth Manifolds" – Springer 2012
4. Lecture Notes