

# PhD course

E2014 – 1. quarter

By Sudarshan Gurjar

**Title:**

## Introduction to Vector Bundles

**Abstract:**

The main aim of this course will be to introduce the study of holomorphic vector bundles on compact Riemann surfaces. The broad outline of the course is as follows:

After introducing some generalities about vector bundles, I will go on to discuss the correspondence between divisors and line bundles on a compact Riemann surface and the theorems of Riemann-Roch and Serre duality. I will then discuss the notions of semi-stability and stability of a bundle and the theorems of Atiyah-Bott, Weil, and Narasimhan-Seshadri on bundles coming from representations of the fundamental group of the Riemann surface. The last part of the course will be a gentle introduction (mostly without proofs) to the construction and properties of the moduli space of semi-stable vector bundles on a compact Riemann surface.