DEPARTMENT OF PHYSICS,
IIT KANPUR

NANOMAGNETISM, SPINTRONICS, AND APPLICATIONS (PHY678)

Objective:

The course will systematically introduce the basic framework of spin-dependent transport phenomena, including magnetoresistance, magnonic waves, and domain wall propagation and their device applications. The different methods of generation and detection of spin currents will be covered in the course. Finally, the design and development of new emerging spin-based logic and memory devices with their functionality will also be covered. This course will be useful for PG as well as advanced UG students.

Instructor:

Rohit Medwal (Southern Lab 204, rmedwal@iitk.ac.in, Ph.2309)

Grading:

1	Midsem Exam	50%
2	Endsem project presentation	50%

References:

- **Physics of Ferromagnetism**, Soshin Chikazumi
- **Nanomagnetism and Spintronics,** Teruya Shinjo
- **Introduction to Spintronics,** S. Bandyopadhyay and M. Cahay
- **Spin Current**, Sadamichi Maekawa, Sergio O. Valenzuela, Eiji Saitoh, Takashi Kimura
- **Spintronics: Fundamentals and applications,** I. Zutic, J. Fabian, and S. Das Sarma, Reviews of Modern Physics 76, 323 (2004)