

## Department of Physics, IIT Kanpur

### NANOMAGNETISM, SPINTRONICS, AND APPLICATIONS (PHY678)

#### **Objective:**

The course will systematically introduce the basic framework of spin-dependent transport phenomena which includes 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 be also 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	Project	50%
2	Midsem Exam	25%
3	Endsem Exam	25%

#### **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)