

## PHY 681 - Synthesis and Characterization Techniques

Course Code & Number	Course Name	C.H.	Lec.	Lab.	Tut.
PHY 681	Synthesis and Characterization Techniques	4	2	4	0

### Syllabus

**Synthesis Techniques:** Synthesis of nanoparticles by sol-gel, ball milling and solvo-thermal techniques. Thin film and heterostructure deposition techniques (MBE, PLD, PCVD and sputtering). Nanocomposites by thermal reaction technique.

#### Characterization techniques

**Structural and Textural Techniques:** Scanning electron microscopy (SEM). Transmission electron microscopy (TEM). X-ray diffraction (XRD). Atomic force microscopy (AFM). Porosimetry.

**Optic, Electric and Magnetic Characterization Techniques:** Optical absorption, transmission and reflectance. Photoluminescence and Electroluminescence.  $I(V)$  technique, Impedance at different frequency and temperature. Hall effect measurement. SQUID technique. VSM technique.

### References

- N.W. Ashcroft and N.D. Mermin, Solid State Physics, Harcourt, 1976.
- P. Hofmann, Solid State Physics, an Introduction, Wiley-VCH, 2008.
- M.P. Marder, Condensed Matter Physics, John Wiley & Sons, Inc. 2000.

