

**SARDAR PATEL UNIVERSITY**  
**Programme & Subject: M.Sc (Instrumentation & Control)**  
**Semester: IV**  
**Syllabus with effect from – December - 2016**

<b>Paper Code: PS04EINC01</b>	<b>Total Credit: 4</b>
<b>Title Of Paper: Fabrication Techniques &amp; Instrumentation</b>	

Unit	Description in Detail	Weightage (%)
I	Physical Vapour Deposition Methods: Direct, Flash, Electron Beam, RF Induction Heating & Molecular Beam Epitaxy, Metal Organic Chemical Vapour Deposition (MOCVD), Sputtering: DC, RF, Magnetron & Ion Beam, Film Thickness & Deposition Monitoring Methods.	25%
II	Electroplating & Spray Pyrolysis, Vacuum Pumps: Rotary, Diffusion, Turbo Molecular, Ion Getter & Cryo Pump, Vacuum Gauges: Pirani, Penning & Hot Cathode Ionization	25%
III	Silicon Single Crystal Growth: Czochralski & Float Zone Methods, Silicon Shaping & Processing Considerations, Epitaxial Deposition of Silicon, Oxidation of Silicon, Lithographic Techniques.	25%
IV	Scanning & Transmission Electron Microscopy, Low Energy Electron Diffraction, Reflection High Energy Electron Diffraction, Electron Probe Micro Analyzer, X-Ray Spectrometry, Numerical Control of Machine Tools, Tool Movement Modes, Interpolation Schemes, Tool Changing Devices, CNC Lathe, CNC, Miller, Other Applications, Spindle Speed & Feedrate Selection, Tool Material Selection, Tool Inserts, NC / CNC Programming, FANUC Codes & Illustrations, Sample Programs	25%

**Basic Text & Reference Books:-**

- Thin Film Technology and Applications, K. L. Chopra & L. K. Malhotra, Tata McGraw-Hill Publishing Company Limited.
- Vacuum Science and Engineering, C. M. Vanatta, Tata McGraw-Hill Publishing Company Limited.
- VLSI Fabrication Principles - Silicon and Gallium Arsenide, Sorab K. Gandhi, John Wiley & Sons, Inc.
- VLSI Technology, C. Y. Chang & S. M. Sze, McGraw-Hill Companies, Inc.
- Semiconductor Devices – Physics and Technology, S. M. Sze, John Willy & Sons, Inc.
- CNC Programming, S. K. Sinha, Galgotia publications Pvt. Ltd.
- Machine Tool Design and Numerical Control, N. K. Mehta, Tata McGraw-Hill Publishing Company Limited.
- Handbook of Analytical Instruments, R. S. Khandpur, Tata McGraw-Hill Publishing Company Limited.

