

PEMF5304 PRECISION ENGINEERING (3-0-0)

MODULE -I (12 hours)

PRECISION ENGINEERING: Introduction - Accuracy & precision – Need – application precision machining –Tool based Micro & Ultra precision Machining grinding – Thermal effects – Materials for tools and machine elements – carbides – ceramic, CBN & diamond. **TOLERANCE AND FITS :**Tolerance – Zone – fits – Variation – Hole & shaft system – limits – expected Accuracy of machining processes – Selective assembly – gauges acceptance tests for machine tools.

MODULE- II (12 hours)

ULTRA PRECISION MACHINE ELEMENTS: Introduction – Guide ways – Drive systems – Spindle drive – preferred numbers – Rolling elements – hydrodynamic & hydrostatic bearings – pneumatic bearings.

MEMS: Introduction – MEMS – principle – Elements – Characteristics – Design – Application: automobile defence, aerospace etc.,

MODULE-III (11 hours)

ERROR CONTROL :Error – Sources – Static stiffness – Variation of the cutting force – total compliance –Different machining methods – Thermal effects – heat source – heat dissipation –Stabilization – decreasing thermal effects – forced vibration on accuracy – clamping & setting errors – Control – errors due to locations – principle of constant location surfaces.

TEXT BOOKS

1. Nakazawa, H. Principles of Precision Engineering, Oxford University Press, 1994.
2. Precision Engineering – R.L. Murthy

REFERENCE

1. Institute of Physics Publishing, Bristol and Philadelphia, Bristol, BSI 6BE U.K.