AMME25 CNC TECHNOLOGY

UNIT-1 INTRODUCTION TO CNC MACHINE TOOLS

1.1 Evolution of CNC Technology, principles, features, advantages, applications,

1.2 CNC and DNC concept, classification of CNC Machines – turning centre, machining centre,

1.3 Grinding machine, EDM, types of control systems, CNC controllers, characteristics, Interpolators– Computer Aided Inspection

UNIT-2 STRUCTURE OF CNC MACHINE TOOL

2.1 CNC Machine building, structural details, configuration and design, guide ways

2.2 Friction, Anti friction and other types of guide ways, elements used to convert the rotary motion to a linear motion

2.3 Screw and nut, recirculating ball screw, planetary roller screw, recirculating roller screw, rack and pinion, spindle assembly, torque transmission elements

2.4 Gears, timing belts, flexible couplings, Bearings.

UNIT-3 DRIVES AND CONTROLS

3.1 Spindle drives – DC shunt motor, 3 phase AC induction motor, feed drives

3.2 Stepper motor, servo principle, DC and AC servomotors,

3.3 Open loop and closed loop control, Axis measuring system

3.4 Synchro, synchro-resolver, gratings, moiré fringe gratings, encoders, inductosysn, laser interferometer.

Reference Books:

1. James Madison, "CNC Machining Hand Book", Industrial Press Inc., 1996.
2. Ken Evans, John Polywka & Stanley Gabrel, "Programming of CNC Machines", Second Edition, Industrial Press Inc, New York, 2002
3. Peter Smid, "CNC Programming Hand book", Industrial Press Inc., 2000.