SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Defence Science)
Semester: IV
Syllabus with Effect from: June - 2014

Paper Code: PT04EDSC01	Total Credit: 4
Title Of Paper: Robotics & Manufacturing Systems	

Unit	Description in Detail	Weightage (%)
I	Robot definition: Robotic systems - Its role in automated manufacturing; robot anatomy; robot classifications and specifications. Robot kinematics, forward and reverse transformation, homogeneous transformations. Robot actuators and control; Pneumatic, hydraulic and electrical drives and controls used in robots.	25%
II	Robot end-effectors, mechanical, magnetic and vacuum grippers, gripping forces RCC and design features of grippers.Robot sensors, different types of contact and non-contact sensors; Robot vision and their interfaces; Robot languages and programming techniques.	25%
III	Applications of robots in materials handling, machine loading/unloading, inspection, welding, spray painting and finish coating, and assembly, etc.; Economic performance and evaluation strategies, Robot installation and planning. Safety features. Mobile Robots, Autonomous robots, intelligent robots	25%
IV	Integrated automation, computers and managerial challenges; high speed machining, precision machining; Nontraditional machining: EDM, ECM, USM, PAM, EBM, AJM, WJM, Explosive forming and LBM.Graphics standards - CAD and CAE, Computer networking, GT concept, FMS, CAPP, CIM, Computer aided Quality Control, CMM, Application of AI in CAD/CAM/CIM., Rapid Prototyping and Tooling.	25%

Basic Text & Reference Books:-

- Industrial Robotic Technology - Programming and Application, M.P.Groover, McGrawhill
- Robotics for Engineers, Y.Koren, McGrawhill.
- Robots Modelling Control and Applications with Software, P.G.Ranky and C.Y.Ho, Springer Verlag Berlin.
- Robotics Technology and Flexible Automation, S.R.Deb, TMH.
- Non-Conventional Machining, P.K.Mishra, Narosa Publishers.
- Manufacturing Science, A.Ghosh, East-West Publications.
- Non-Traditional Manufacturing, Benidict.
- Non-Traditional Machining, Dr. A. Bhattacharya, The Institution of Engineers (Calcutta)
- Automation, Production System & Computer Integrated Manufacturing, M.P. Groover, Pearson Education.
- Advanced Machining Process, Vijay K. Jain Allied Publisher
- Modern Machnning processes, Pandey P. C.and Shah H. S., Tata McGrow Hill
- Industrial Robotics, Ganesh S. Hegde, Laxmi Publications.
- Anatomy of a Robot, Charles Bergrea, McGrow Hill