

SRM UNIVERSITY			
SCHOOL OF MECHANICAL ENGINEERING			
LESSON PLAN			YEAR 2013-2014
COURSE TITLE/CODE : DRIVES AND CONTROL SYSTEMS FOR ROBOTS / ME2303			
BRANCH/YEAR/SEM : Mtech - Robotics / I/ II			
Sl. No.	TITLE	REF. BOOK	CHAPTER NO.
ROBOT DRIVE MECHANISM			
1	IntroductObjectives, motivation,	R2,R3	Ch-02,03
2	open loop control, closed loop control with velocity and position feedback	R2,R3	Ch-02,03
3	Types of drive systems. Functions of drive system.	R2,R3	Ch-02,03
4	Lead Screws, Ball Screws,	R2,R3	Ch-02,03
5	Chain & linkage drives	R2,R3	Ch-02,03
6	Belt drives, Gear drives,	R2,R3	Ch-02,03
7	Precision gear boxes	R2,R3	Ch-02,03
8	Harmonic drives, Cyclo speed reducers.	R2,R3	Ch-02,03
HYDRAULIC DRIVES			
9	Introduction, Requirements,	R2,R4	Ch-02
10	Hydraulic piston	R2,R4	Ch-02
11	Transfer valve	R2,R4	Ch-02
12	Hydraulic circuit incorporating control amplifier	R2,R4	Ch-02
13	hydraulic fluid considerations,	R2,R4	Ch-02
14	hydraulic actuators Rotary and linear actuators.	R2,R4	Ch-02
15	Hydraulic components in robots.	R2,R4	Ch-02
16	Hydraulic components in robots.	R2,R4	Ch-02
PNEUMATIC DRIVES			
17	Introduction, Advantages	R4	Ch-02
18	Pistons-Linear Pistons	R4	Ch-02
19	Pistons- Rotary pistons	R4	Ch-02
20	Motors -Flapper motor	R4	Ch-02
21	Motors - Geared motor	R4	Ch-02
22	Components used in pneumatic control.	R4	Ch-02
23	Pneumatic proportional controller	R4	Ch-02
24	pneumatically controlled prismatic joint.	R4	Ch-02
ELECTRIC DRIVES			
25	Introduction, Types,	R3,R4	Ch-2
26	DC electric motor	R3,R4	Ch-2
27	AC electric motor	R3,R4	Ch-2
28	stepper motors,	R3,R4	Ch-2
29	half step mode operation,	R3,R4	Ch-2
30	micro step mode	R3,R4	Ch-2
31	Types of stepper motors	R3,R4	Ch-2
32	Direct drive actuator.	R3,R4	Ch-2

33	Direct drive actuator.	R3,R4	Ch-2
SERVO SYSTEMS FOR ROBOT CONTROL			
34	General aspects of robot control.	R2	Ch-4
35	Basic control techniques	R2	Ch-4
36	Mathematical modeling of robot servos,	R2	Ch-4
37	Error responses and steady state errors in robot servos	R2	Ch-4
38	Feed back and feed forward compensations,	R2	Ch-4
39	Hydraulic position servo, computer controlled servo system for robot applications,	R2	Ch-4
40	Selection of robot drive systems.	R2	Ch-4

REFERENCE BOOKS

- R1 Francis N-Nagy Andras Siegler, Engineering foundation of Robotics, Prentice Hall Inc., 1987.
- R2 Richard D. Klafter, Thomas. A, Chmielewski, Michael Negin, Robotics Engineering an Integrated Approach, Phi Learning., 2009
- R3 P.A. Janaki Raman, Robotics and Image Processing an Introduction, Tata Mc Graw Hill Publishing company Ltd., 1995.
- R4 Mikell P Groover & Nicholas G Odrey, Mitchel Weiss, Roger N Nagel, Ashish Dutta, Industrial Robotics, Technology programming and Applications, Tata McGraw-Hill Education, 2012.
- R5 Bernard Hodges, Industrial Robotics, Second Edition, Jaico Publishing house, 1993.
- R6 Robert J. Schilling, Fundamentals of Robotics Analysis and Control, PHI Learning., 2009.
- R7 Tsuneo Yohikwa, Foundations of Robotics Analysis and Control, MIT Press., 2003
- R8 John J. Craig, Introduction to Robotics Mechanics and Control, Third Edition, Pearson, 2008.

Name of the Faculty : S/OliverNesaRaj
Signature :

[Signature]
9.12.13

[Signature]
Dean / Mechanical