

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, A. Rangampet-517 102

Department of Mechanical Engineering Lesson Plan

Name of the Subject

:Kinematics Of Machinery (14BT40301)

Class& Semester

IIB. Tech. - II Semester

Nameof the faculty Member

:K VINOD KUMAR

S.	Торіс	No. of	Book(s)	Topics for self-			
UNIT – I: MECHANISMS AND MACHINES							
1	Elements or links, classification: Rigid, Flexible and Fluid link	1	T1	Visit http://www.enginee			
2	Types of Kinematic pairs: Sliding, Turning, Rolling, Screw and Spherical Pairs	1	T1	ringvideos.org/mec hanisms Go through all the mechanisms			
3	Lower and Higher pairs; Closed and Open pairs;	1	T1				
4	Constrained motions: Completely, Partially or successfully and incompletely constrained motions	1	T1&T2				
5	Classification of machines; Kinematic chain; Types of joints: Binary, Ternary and Quaternary joints	1	T1 & T2				
6	Number of degree of freedom for plane mechanisms and its applications	1	T1 &R1				
7	Kutzbach and Grubler's criterions	1	T1, R1, &R2				
8	Inversion of mechanisms: Quadric cycle, Single slider and Double slider crank chains.	1	T1, R1, & R2	-			
Total periods required: 8							
UNIT – II: VELOCITY AND ACCELERATION ANALYSIS							
9	Instantaneous center of rotation; Centroids and axodes	1	T1 & T2	Read definition and units of velocity and acceleration.			
10	Relative motion between two bodies; Aronhold Kennedy (three center in line) theorem;	1	T1, T2 & R2				
11	method for determination of Instantaneous Centre	2	T1, T2 & R2				
12	Diagrams for simple mechanisms and determination of angular Velocity of links and linear velocities of point	1					
13	Velocity and acceleration diagrams	1					

14	Relative velocity method for four bar mechanism with revolute joint	1						
15	Slider-crank mechanism, and its inversions	1						
Total periods required: 8								
UNIT-III: MECHANISMS WITH LOWER PAIRS								
16	Pantograph	1	T1, T2 & R1					
17	Exact Straight Line Motion Mechanisms: Peaucellier, Hart and Scott Russell's mechanism	2	T1, T2 & R1					
18	Approximate Straight Line Motion Mechanisms: Watt's, Grasshopper, Tchebicheff's and Robert mechanisms	2	T1, T2 & R1					
19	Steering mechanisms: Conditions for correct steering; Davis Steering gear and Ackerman steering gear mechanisms	3	T1, T2 & R1					
20	Hooke's joint: Single and double Hooke's joint; universal coupling.	2	T1, T2 & R1					
Total periods required: 10								
UNIT – IV: CONSTRUCTION OF CAM PROFILE								
	UNIT – IV: CONSTRUCT	TON OF C	AM PROFILE					
21	UNIT – IV: CONSTRUCT Introduction to cams and followers, their uses	$\frac{1}{1}$	AM PROFILE T1 & T2	Time-varying Acceleration				
21 22	UNIT – IV: CONSTRUCT Introduction to cams and followers, their uses Types of followers and cams, terminology,	1 1 1	AM PROFILE T1 & T2 T1 & T2	Time-varying Acceleration. 1D Kinematics- Acceleration				
21 22 23	UNIT – IV: CONSTRUCT Introduction to cams and followers, their uses Types of followers and cams, terminology, Types of follower motion for translating follower; uniform velocity; simple harmonic motion	1 1 2	AM PROFILE T1 & T2 T1 & T2 T1 & T2 T1 & T2	Time-varying Acceleration. 1D Kinematics- Acceleration Depends on Position. Project 12-1D in R2.				
21 22 23 24	UNIT – IV: CONSTRUCT Introduction to cams and followers, their uses Types of followers and cams, terminology, Types of follower motion for translating follower; uniform velocity; simple harmonic motion Maximum velocity and maximum acceleration during outward and return stroke in the case of uniform velocity, SHM, and uniform acceleration and retardation	1 1 2 2	AM PROFILE T1 & T2 T1 & T2 T1 & T2 T1 & T2	Time-varying Acceleration. 1D Kinematics- Acceleration Depends on Position. Project 12-1D in R2.				
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28	Forms of teeth: cycloidal and involute profiles, Velocity of sliding	2	T1, R1, & R2	
29	Phenomena of interference; Condition for minimum number of teeth to avoid interference; Expressions for arc of contact and path of contact	3	T1, R1, & R2	
31	Gear trains: Introduction; types: simple, compound, reverted and epicyclic gear train;	2		
32	Train value; Methods of finding train value or velocity ratio; simple problems.	2		
Total periods required:		11		
Grand total periods required:		45		

TEXT BOOKS:

- 1. S. S. Rattan, Theory of Machines and Mechanisms, Tata McGraw Hill Education, Third Edition, 2009
- 2. R.S. Khurmi, Theory of machines, S.Chand Publications, Fourteenth Revised Edition, 2012

REFERENCE BOOKS:

- 1. Dr. R. K. Bansal, Dr. J. S. Brar , Theory of Machines, Laxmi Publications, Fourth Edition, 2013
- 2. Ballaney. P. L., Theory of Machines and Mechanisms, Khanna Publishers, 2005
- 3. Joseph Edward Shigley and John Joseph Uicker, Jr., Theory of Machines and Mechanisms, MGH, Third Edition, New York.
- 4. Bevan T, Theory of Machines, CBS Publishers and Distributors, New Delhi, 2002.