Course Number and Name										
BME401 – DYNAMICS OF MACHINES	YNAMICS OF MACHINES									
Credits and Contact Hours	ontact Hours									
4 & 60										
Course Coordinator's Name										
Mr.Goldem Renjith Nimal										
Books and References										
EXT BOOKS:										
R.S.Khurmi-Theory of Machines-S.Chand Publications.										
S.S.Rattan-Theory of Machines- Tata McGraw Hill, 2005.										
2. Sistractan fricory of Machines fata Mediaw fini, 2003.										
DEFENSES.										
REFERENCES:										
1. Rao.J.S. and Dukkipatti, Mechanism and Machines Theory, 2nd Edition-Wiley Eastern Ltd, 1992.										
2. Groover.G.K. Mechanical Vibrations- Nemchand & Bros., 2001.										
3. Singh.V.P. Mechanical Vibrations-Dhanpatrai & co (p) Ltd, 2005.										
4. royalmechanicalbuzz.blogspot.com//theory-of-machines-by-rs-khurmi										
Course Description										
Course Description To understand the method of static force analysis and dynamic force analysis of mechanisms										
To study the undesirable effects of unbalances in rotors and engines.										
Prerequisites Co-requisites										
Mathematics I & II Nil	•									
required, elective, or selected elective (as per Table 5-1)										
Required										
Course Outcomes (COs)										
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CO1 Upon completion of this course, the Students can able to predict the force analysis.	/sis in									
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	CO5	Н	М	Н							Н	
	CO6	Н	М	Н		L	L	L	L		Н	

List of Topics Covered

UNIT I FORCE ANALYSIS OF MECHANISMS

12

Static, Inertia and combined force analysis- Graphical and analytical method- Slider crank mechanism and four bar mechanism. Turning moment diagram and flywheel-Applications in engine, Punching presses.

UNIT II BALANCING

12

Static and dynamic balancing-Balancing of rotating masses- Balancing of several masses in different planes. Primary and secondary unbalanced forces of reciprocating parts-Balancing of in line engines- Firing order- Balancing of 'V' and 'W' engines.

UNIT III FREE VIBRATIONS OF SINGLE DEGREE OF FREEDOM SYSTEMS

12

Fundamentals of vibrations-Undamped free vibrations of single d.o.f systems—Derivation & solution of differential equation-Torsional Vibrations-single rotor- Equivalent stiffness of spring combinations-Bifilar, Trifilar suspensions-Compound pendulum-Types of damping-Damped free vibrations of single d.o.f-over, critical, under damped- Damping coefficient - Critical damping coefficient-Logarithmic decrement

UNIT IV FORCED VIBRATIONS OF SINGLE DEGREE OF FREEDOM SYSTEMS 12

Forced vibrations with-Constant harmonic excitation-Rotating & Reciprocating unbalance-Excitation of the support-Energy dissipated by damping-Forced vibrations with coulomb, viscous damping-Vibration Isolation and Transmissibility- Vibration Absorbers

UNIT V CRITICAL SPEEDS AND SHAFTS WITH ROTORS

12

Lateral vibration of beams - Whirling speed of shaft - Shafts with two & three rotors-Geared system. Dunkerly's method for different types of beams & shaft with several loads.