

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: V

PRODUCTION ENGINEERING

Subject Name: **Dynamics of Machines & Production Engineering Drawing**

Subject Code: **152504**

| Teaching Scheme | | | | Evaluation Scheme | | |
|-----------------|----------|-----------|-------|------------------------------------|---------------------------------|------------------|
| Theory | Tutorial | Practical | Total | University Exam (Theory) (E) | Mid Sem Exam (Theory) (M) | Practical (I) |
| 4 | 2 | 0 | 6 | 70 | 30 | 50 |

| Sr. No. | Course content |
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| 1. | Dynamic Force analysis of mechanisms: Introduction, D’alembert’s principle, equivalent offset inertia force, dynamic analysis of four link mechanism, dynamic analysis of slider crank mechanism, velocity & acceleration of piston, angular velocity & angular acceleration of connecting rod, engine force analysis, turning moment on crank shaft, dynamically equivalent system inertia of the connecting rod, inertia force in reciprocating engines, turning moment diagrams, fluctuation of energy, fly wheel. |
| 2. | Balancing: Introduction, static balancing, dynamic balancing, transference of force from one plane to another plane, balancing of several masses in different planes, force balancing of linkages, balancing of reciprocating mass, balancing of locomotives , secondary balancing, balancing of inline engines, balancing of v-engines, (balancing of w, v-8, v-12 engines, balancing of radial engines, balancing machines, field balancing) |
| 3. | Vibrations: Introduction, definition, types of vibrations, basic features of vibrating system, degree of freedom. Longitudinal vibration:- free long vibration, displacement, velocity & acceleration. Inertia, effect of the mass of spring, damped vibration, logarithmic decrement, force vibration, force damped vibration, magnification factor, vibration location and transmissibility, forcing due to unbalance, forcing due to support motion. Transverse vibration single concentrated load, uniformly loaded shaft, shaft carrying several load, whirling of shafts, Torsional vibration, free torsional vibration (single rotor), inertia effect of mass of shaft, multifilar system, free torsional vibration (two rotor system, three rotor system), free torsional vibration of geared system. |

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| 4. | Detail and assembly drawing: Assembly: Introduction, types, accepted work for assembly drawing, sequence of preparing assembly drawing, illustrative problem. |
| 5. | Missing views (interpretation of views): Introduction reading of orthographic views, blue print missing lines, missing views, interpretation of views, identification of plan, problems. |
| 6. | Intersection of solid: Introduction line of intersection, methods of determining the line of intersection between surface of two interpenetrating solids, intersection of two prisms, intersection of cylinder and cylinder, intersection of cylinder prism, intersection of cone and cylinder, intersection of cone and prism, intersection of cone and cone, intersection sphere and cylinder/prism |
| 7. | Fasteners: Introduction, types, screw thread terminology, forms of screw thread, types of nuts, locking arrangements of nuts, set screws, stud/stud bolt, foundation bolts, keys, cotter joint, rivet heads, welded joints, |
| 8. | Engineering symbols(drafting): Geometric symbols, surface roughness symbols, welding symbols, Limits and fits. |

Reference Books:

1. Theory of Machines by R.S.Khurmi, S Chand & Co.
2. Theory of Machines by Rattan S S., Tata McGrawhill
3. Geometric Dimensioning & Tolerancing by P.S.Gill, Kataria & Sons
4. Theory of Machines by Singh V.P., Dhanpat Rai & Sons
5. Theory of Machines by R. K. Bansal, Laxmi Pub
6. Machine Drawing by N. D. Bhatt, Charotar Pub.