Mechanical Engineering

Semester VI						
S.No	Course Code	Course Name	L	T	P	C
1	CE 301	Environmental Studies	3	0	0	6
2	ME 313	Kinematics and Dynamics of Machinery lab	0	0	3	3
3	ME 315	Manufacturing processes laboratory	0	0	3	3
4	ME 316	Applied Thermodynamics Laboratory	0	0	3	3
5	MA 406	Introduction to Numerical Methods(1st Half)	3	1	0	4
6		Elective Course from Physics Department	3	0	0	6
7		Elective 2	3	0	0	6
8		Elective 3	3	0	0	6
		Total Credits				37

Mechanical Engineering

1	**Title of the course** (L-T-P-C)	**Kinematics and Dynamics of Machinery lab** **(0-0-3-3)**
2	**Pre-requisite courses(s)**	
3	**Course content**	Fabrication or model demonstration of ● Lower and Upper joins ● Multi-degree of freedom linkages with verification of Kutzback's Equation ● Inversions of 4R, 3R-P and 2R-2P four-link linkages ● Grashof Criterion ● Approximate and Exact Straight line generating mechanisms ● Pantograph Linkages ● Ackerman's steering linkage ● Geneva Mechanism ● Simple, Compound and Planetary Gear trains – Verification of velocity analysis, velocity ratio, instantaneous centers – Demonstration of inversion in synthesis of Cam profiles – Examination of geometry of involute gears in mesh – Passive Vibration Analysis; Damped response – Active Vibration Analysis; Frequency Response; Resonance – Vibration of two degree of freedom systems – Balancing of rotating masses – Balancing of reciprocating masses – Critical speed of shafts
4	**Texts/References**	**1.** Kinematics, Dynamics, and Design of Machinery: Edition 3 **2.** Kenneth J. Waldron, Gary L. Kinzel, Sunil K. Agrawal, 10 May 2016 John Wiley & Sons

1	**Title of the course** (L-T-P-C)	**Manufacturing processes laboratory** **(0-0-3-3)**
2	**Pre-requisite courses(s)**	Manufacturing processes
3	**Course content**	**List of experiments:** **1.** CNC milling programming **2.** CNC turning programming **3.** Surface Roughness testing **4.** Eccentric Turning **5.** Angle measurement using Sine bar **6.** Chip Thickness measurement using microscope **7.** Different type of drilling **8.** Shaping **9.** Green Sand moulding Casting process Solidification Study Digital Fabrication (3D printing)
4	**Texts/References**	• Val Marinov Manufacturing Process Design Laboratory Manual, Kendall/Hunt Publishing Company, ISBN 1465275312, 9781465275318 • R. K. Rajput A Textbook of Manufacturing Technology: Manufacturing Processes • Ghosh and A. K. Mallik, Manufacturing Science, Affiliated East West Press, 1985. HMT, Production Technology, Tata McGraw Hill, 1980. • J. Mcgeough, Advanced Methods of Machining, Chapman and Hall, 1988.

1	**Title of the course** (L-T-P-C)	**Introduction to Numerical Methods** **(3-1-0-4)**
2	**Pre-requisite courses(s)**	Calculus, MA101 & Linear Algebra, MA 106
3	**Course content**	Interpolation by polynomials, divided differences, error of the interpolating polynomial, piecewise linear and cubic spline interpolation. Numerical integration, composite rules, error formulae. Solution of a nonlinear equation, bisection and secant methods. Newton's method, rate of convergence, solution of a system of nonlinear equations, Numerical solution of ordinary differential equations, Euler and Runge-Kutta methods, multi-step methods, predictor-corrector methods, order of convergence, Finite difference methods, numerical solutions of elliptic, parabolic, and hyperbolic partial differential equations. Exposure to MATLAB
4	**Texts/References**	S. D. Conte and Carl de Boor, Elementary Numerical Analysis- An Algorithmic Approach (3rd Edition), McGraw-Hill, 1980.