

1. Course number and name: **ENGR 2302 –Dynamics**
2. Credits and contact hours: **3 credits**
3. Instructor's or course coordinator's name: **Dr. Xiaohua Li**
4. Text book, title, author, and year:

Engineering Mechanics: Dynamics, 14th Edition, Pearson, 2015, R.C. Hibbeler

5. Specific course information
 - a. brief description of the content of the course (catalog description): **3 hours. Basic theory of engineering mechanics, using calculus, involving the motion of particles, rigid bodies, and systems of particles; Newton's Laws; work and energy relationships; principles of impulse and momentum; application of kinetics and kinematics to the solution of engineering problems.**
 - b. prerequisites or co-requisites: **Prerequisite(s): ENGR 2301, MATH 1720.**
 - c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: **Required**
6. Specific goals for the course:

ENGR 2302 Course Learning Outcomes	ABET Student Outcomes				
	1	2	3	4	5
Express dynamic quantities as vectors in terms of Cartesian components and Normal-tangential coordinates.	X				
Compute mass moments of inertia for systems of particles and rigid bodies.	X				
Solve kinematic problems involving rectilinear and curvilinear motion of particles	X				
Solve kinetic problems involving a system of particles using Newton's Second Law	X				
Apply the principles of work and energy and conservation of energy to the solution of engineering problems involving particles and systems of particles	X				
Apply the principles of impulse and momentum and conservation of momentum to the solution of engineering problems involving particles and systems of particles	X				
Solve kinematic problems involving the translation and rotation of a rigid body	X				
Solve kinematic problems involving general planar of rigid bodies	X				

7. Brief list of topics to be covered:

Topics to Be Covered	
Curvilinear Motion of a Particle	Equation of Motion
Work, Energy and Principle of Work and Energy	Conservation of Energy
Impulse and Momentum	Conservation of linear Momentum and Angular Momentum
Planar Motion of a Rigid Body	Relative motion Analysis: Velocity and Acceleration