

PHYS 320 ANALYTICAL MECHANICS

Dr. Gregory W. Clark
Fall 2018.

Final Exam time change:
Wednesday, 12 Dec, 6:30 – 8:20 pm

Lagrangian Mechanics

Lagrangian function:

$$L \equiv T(q_j, \dot{q}_j, t) - U(q_j, t)$$

Euler-Lagrange equations of motion:

$$\frac{\partial L}{\partial q_j} \equiv \frac{d}{dt} \frac{\partial L}{\partial \dot{q}_j}, \quad j = 1, 2, 3, \dots, s$$

Lagrangian Mechanics:

$$\frac{\partial L}{\partial q_j} \equiv \text{generalized force, } j\text{th component}$$

$$\frac{\partial L}{\partial \dot{q}_j} = \text{generalized momentum, } j\text{th component}$$

$$\frac{\partial L}{\partial q_j} \equiv \frac{d}{dt} \frac{\partial L}{\partial \dot{q}_j}$$



**generalized force
= rate of change of
generalized momentum**