Irreversible Process	The system and all parts of its surroundings cannot be exactly restored to their respective initial states after the process has occurred
Exergy	Maximum theoretical work obtainable form an overall system

Chapter 2: Energy and First Law

- $Q - W = \Delta U + \Delta KE + \Delta PE$

Variable	Name
Q	Heat Transfer
W	Work
ΔU	Change in specific internal energy
ΔKE	Change in kinetic energy
ΔPE	Change in potential energy

This is the closed system energy balance

- $W = \int p\, dv$

Cycles:

- Process 1-2, 2-3, 3-1
- $\Delta E_{cycle} = 0$
- Power Cycle: $W_{cycle} = Q_{in} - Q_{out}$
- Thermal Efficiency of Power Cycle: $\eta = \frac{Qin - Qou}{Qin} = 1 - \frac{Qout}{Qin}$
- Refrigeration and Heat Pump Cycles: $W_{cycle} = Q_{out} - Q_{in}$
- Performance of Refrigeration Cycle: $\beta = \frac{Qin}{Wcy}$ (β is the coefficient of performance)
- Performance of Heat Pump Cycle: $\gamma = \frac{Qout}{Wcycl}$ (γ is the coefficent of peroformance)

Chapter 3: Evaluating Properties

- Quality: $u = u_f + x(u_f - u_g)$
- 2 properties are needed to lock in a state:
  - T, p
  - x, T
  - h, p
  - saturated liquid, p
- Questions to ask when moving form state one to state two:
  - Is v constant?