

# IS 2150 / TEL 2810

## Introduction to Security



James Joshi  
Associate Professor, SIS

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Hybrid Models

Role based  
Access Control



# Objective

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- Define/Understand various Integrity models
  - Clark-Wilson
- Define/Understand
  - Chinese Wall Model
  - Role-based Access Control model
- Overview the secure interoperation issue



# Clark-Wilson Integrity Model

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- Transactions as the basic operation
- Integrity defined by a set of constraints
  - Data in a *consistent* or *valid* state when it satisfies these
  - Example: Bank
    - $D$  today's deposits,  $W$  withdrawals,  $YB$  yesterday's balance,  $TB$  today's balance
    - Integrity constraint:  $D + YB - W$
- *Well-formed transaction*
  - A series of operations that move system from one consistent state to another
  - State before transaction consistent  $\Rightarrow$  state after transaction consistent
- Issue: who examines, certifies transactions done correctly?
  - Separation of duty is crucial