Summary

Communication among asynchronous processes requires synchronization....

 – Precedence constraints: a partial ordering among operations
 – Semaphores as a mechanism for enforcing precedence constraints
 – Mutual exclusion (critical sections, atomic transactions) as a common compound precedence constraint
 – Solving Mutual Exclusion via binary semaphores
 – Synchronization *serializes* operations, limits parallel execution.

Many alternative synchronization mechanisms exist!

Deadlocks:

 – Consequence of undisciplined use of synchronization mechanism
 – Can be avoided in special cases, detected and corrected in others.