

## Additions to tcb object

normalPrio: A variable for storing/retrieving old priority when taking or giving semaphore.

## semaphoreHandle

- Prototype: typedef struct{bool isFree; int ceilPrio;}semaphoreHandle;
- Description: the semaphore struct used by all semaphores
- Elements:
  - isFree: false if semaphore is locked, true otherwise. Initializes to true.
  - ceilPrio: used for IPCP. Initializes to highest priority task using the semaphore.

## ROSA\_semaphoreCreate

- Prototype: semaphoreHandle ROSA\_semaphoreCreate(int priorityCeiling);
- Description: Create a semaphore
- Parameters:
  - int priorityCeiling: ceiling of all priorities
- Return value:
  - semaphoreHandle: the handle of the newly created semaphore

## ROSA\_semaphoreGive

- Prototype: int ROSA\_semaphoreGive(semaphoreHandle semaphore);
- Description: Release semaphore given
- Parameters:
  - semaphoreHandle semaphore: semaphore to be released
- Return value:
  - 1 if semaphore is released, 0 if an error occurs

## ROSA\_semaphoreTake

- Prototype: int ROSA\_semaphoreTake(semaphoreHandle semaphore, int waitTime);
- Description: Take given semaphore
- Parameters:
  - semaphoreHandle semaphore: semaphore to be taken
  - int waitTime: the time (in ticks) to wait before trying to take the semaphore again. If zero, only try to take semaphore once.
- Return value:
  - 1 if semaphore is taken, 0 if the semaphore could not be taken, -1 for errors