

# Sistemes operatius

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## **Introducció**

En aquesta assignatura es presenta el sistema operatiu (SO) des del punt de vista dels diferents usuaris d'un sistema informàtic. Aquest tractament comprèn aspectes que van des de la visió del sistema que té un usuari no especialitzat, fins a la del tècnic encarregat de l'administració del sistema, passant per la de la persona que desenvolupa aplicacions. Aquesta visió se centra, des de l'òptica de l'ús, en el coneixement tant dels principals serveis que ofereix el sistema operatiu com de les eines que s'hi associen.

Per a assolir els objectius d'aquesta assignatura, els continguts teòrics es combinen amb els pràctics, basats en un sistema operatiu de la família Unix.

## Objectius

Aquesta assignatura conté els materials didàctics necessaris perquè l'estudiant assolixi els objectius següents:

1. Conèixer els serveis que ofereix un sistema operatiu.
2. Adquirir els coneixements necessaris per a accedir als serveis del sistema operatiu des de l'interpret d'ordres.
3. Conèixer el concepte de procés i els aspectes relacionats amb la manipulació dels processos.
4. Aprendre els principis bàsics de la gestió de la memòria.
5. Conèixer el concepte de dispositiu i els aspectes relacionats amb la manipulació dels diferents dispositius.
6. Veure el sistema de fitxers i els aspectes relacionats amb l'ús d'aquest sistema.
7. Conèixer els principis de la comunicació i la sincronització entre processos.

## Continguts

### Mòdul didàctic 1

#### **Introducció als sistemes operatius**

José Ramón Herrero Zaragoza, Enric Morancho Llena i Dolors Royo Vallés

1. Classificació del programari. Definició de sistema operatiu
2. Visió històrica dels sistemes operatius
3. Els serveis que ofereix el sistema operatiu

### Mòdul didàctic 2

#### **El sistema operatiu: una màquina virtual**

José Ramón Herrero Zaragoza, Josep Lluís Marzo i Lázaro i Enric Morancho Llena

1. Programari de sistema i màquines virtuals
2. Els mecanismes d'entrada al sistema operatiu
3. Suport del maquinari per a implementar el sistema operatiu
4. Introducció a la planificació del processador

### Mòdul didàctic 3

#### **La gestió de la memòria**

José Ramón Herrero Zaragoza, Enric Morancho Llena i Dolors Royo Vallés

1. Espais d'adreces
2. Un primer mecanisme de traducció dinàmica
3. Memòria virtual
4. Modificació dinàmica de l'espai lògic
5. Errors de programació relacionats amb l'accés a la memòria

### Mòdul didàctic 4

#### **Entrada/sortida**

José Ramón Herrero Zaragoza, Teodor Jové Lagunas i Enric Morancho Llena

1. El concepte d'*entrada/sortida* (E/S)
2. El concepte de *dispositiu d'entrada/sortida*
3. Les característiques dels dispositius d'entrada/sortida
4. Els dispositius físics, els lògics i els virtuals
5. La independència dels dispositius
6. Optimització de l'entrada/sortida
7. Exemples

### Mòdul didàctic 5

#### **El sistema de fitxers**

José Ramón Herrero Zaragoza, Teodor Jové Lagunas i Enric Morancho Llena

1. Definició del sistema de fitxers
2. El concepte de *fitxer*
3. L'espai de noms
4. La protecció

## 5. Exemples de sistema de fitxers i protecció

### Mòdul didàctic 6

#### **La gestió de processos**

Teodor Jové Lagunas, Josep Lluís Marzo i Lázaro, Enric Morancho Llena i José Ramón Herrero Zaragoza

1. El procés: un cop d'ull des de l'interior del sistema
2. El cicle de vida d'un procés
3. Fluxos d'execució
4. Exemples de gestió de processos
5. *Pthreads*

### Mòdul didàctic 7

#### **Comunicació i sincronització**

José Ramón Herrero Zaragoza, Enric Morancho Llena i Dolors Royo Vallés

1. Comunicació i sincronització
2. Primer escenari: compartició de recursos
3. Segon escenari: memòria no compartida
4. *Deadlocks* (abraçades mortals o interbloquejos)

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