**Nazwa przedmiotu:**

Distributed Operating Systems

**Koordynator przedmiotu:**

dr hab. inż. Ewa Niewiadomska-Szynkiewicz, dr inż. Adam Kozakiewicz

**Status przedmiotu:**

Fakultatywny dowolnego wyboru

**Poziom kształcenia:**

Studia I stopnia

**Program:**

Informatyka

**Grupa przedmiotów:**

Electives

**Kod przedmiotu:**

brak

**Semestr nominalny:**

7 / rok ak. 2009/2010

**Liczba punktów ECTS:**

4

**Liczba godzin pracy studenta związanych z osiągnięciem efektów uczenia się:**

**Liczba punktów ECTS na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich:**

**Język prowadzenia zajęć:**

polski

**Liczba punktów ECTS, którą student uzyskuje w ramach zajęć o charakterze praktycznym:**

**Formy zajęć i ich wymiar w semestrze:**

|  |  |
| --- | --- |
| Wykład: | 30h |
| Ćwiczenia: | 0h |
| Laboratorium: | 15h |
| Projekt: | 0h |
| Lekcje komputerowe: | 0h |

**Wymagania wstępne:**

Operating systems, elementary knowledge of data bases and programming languages.

**Limit liczby studentów:**

**Cel przedmiotu:**

The goal of the course is to provide students with distributed operating systems principles and paradigms, design and implementation, distributed file systems implementation, and popular cluster and grid systems. Students will be familiar with development any application executing in distributed environment with the focus on consistency and fault tolerance.

**Treści kształcenia:**

The field of distributed systems covers many different subjects. The course is structured in two parts. The first part covers principles and paradigms of distributed systems, the second one focuses on selected implementations ? cluster and grid systems. We start from introduction to distributed operating systems (definition, goals and architecture, hardware and software concepts, modern architectures). Next, we focus on processes and threads. We discuss aspects concerned with processes migration and provide an overview of load balancing algorithms. We consider most important principles: communication (layered protocols, client-server and peer-to-peer models, RPC, RMI, message-passing and stream-oriented communication), synchronization (physical and logical time, time synchronization, distributed snapshot, election algorithms, distributed mutual exclusion, distributed transactions), naming (distributed name spaces, location services, aliases-identifiers-addresses, redirection), consistency and replication (data-based and client-based consistency models, consistency protocols), fault tolerance (types of faults, redundancy, reliable communication & RPC, virtual synchrony, distributed commit), and security (service isolation and minimization, access control models, trust management, introduction to cryptography, public key infrastructure, secure protocols). In the second part of the course we discuss selected distributed file systems: (NFS, Coda, Lustre, GFS), cluster systems implementations (MOSIX, SSI, Kerrighed, queuing systems PBS), and grid systems (Unicore, Condor, Globus).

**Metody oceny:**

There are two tests in the semester, 25 points each (sum: 50 points). Next 50 points is for the laboratory task, which is obligatory. Requirements to receive the credit in the course: minimum 50 points for tests and laboratory (minimum 25 points for tests and minimum 18 points for laboratory) Marks: 0-50: 2, 51-60: 3, 61-70: 3.5, 71-80: 4, 81-90: 4.5, 91-100: 5

**Egzamin:**

**Literatura:**

1.A.S. Tanenbaum, M. Van Steen, ?Systemy rozproszone: zasady i paradygmaty?, WNT 2006 2.A.S. Tanenbaum, ?Operating systems?, 1997 3.A.S. Tanenbaum, ?Modern operating systems?, Prentice-Hall, 1992 4.A.S. Tanenbaum, ?Rozproszone systemy operacyjne?, PWN, 1997 5.Manuals of clusters and grids available in Internet (Web pages)

**Witryna www przedmiotu:**

**Uwagi:**

## Efekty przedmiotowe