

University of Arkansas – Fort Smith
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General Syllabus

CS 4223 Computing at Scale

Credit Hours: 3

Lecture Hours: 3

Laboratory Hours: 0

Prerequisite: CS 3223 Routing and Switching

Effective: 2018-2019

I. Course Information

A. Catalog Description

Introduction to economies of scale related to computing infrastructure. Network design techniques such as Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS) and Virtual Desktop Infrastructure (VDI) will be introduced along with hands-on experiences with current tools utilized to create these structures. On-site and off-site data center design techniques will also be examined.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Examine organizational network design ramifications of centralized (data center-based) versus decentralized computing.
2. Evaluate the different types of data center utilization – off-site (public cloud), on-site (private cloud) and hybrid (public + private cloud) and organizational ramifications of different design choices.
3. Compare and contrast aspects of a software-defined data center versus a hardware-based data center and how each can be utilized to scale data centers.
4. Evaluate and assess the design impacts of implementing SaaS versus VDI for organizational application delivery.
5. Evaluate and assess the design impacts of implementing PaaS versus IaaS for organizational computing infrastructure.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking Skills: Students will identify performance and cost tradeoffs of networking and data center design decisions.

Quantitative Reasoning: Students will combine performance and cost tradeoffs of networking and data center design choices with organizational requirements to determine appropriate decisions.

Communication Skills (written and oral)

Students will write a pilot report about their cloud implementation and present the findings to the class.

III. Major Course Topics

- A. Public and Private Data Centers
- B. Data Center Infrastructure – Hardware Defined
- C. Data Center Infrastructure – Software Defined
- D. Software as a Service (SaaS) and Virtual Desktop Infrastructure (VDI)
- E. Infrastructure as a Service (IaaS) and Platform as a Service (PaaS)
- F. IT-serviced versus self-service clouds
- G. Security / Business Continuity