Basic Course Information CS 5660

Course Title: Distributed Computing Systems

Units: 3

C/S Classification #: C-2

Component (select one): Lecture

Instructional Mode (select all appropriate choices): Face-to-Face and web-assisted

Grading Basis (select one): Graded only

Repeat Basis (select one): May be taken only once

Cross listed Course (if offered with another department):

Dual-listed Course (if offered as lower/upper division or undergraduate/graduate):

Major course/Service course/GE course (select all appropriate choices): Major course

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I Catalog Description

Distributed systems models. Distributed naming. Synchronization. Consistency. Fault tolerance. Security. Grid computing. Computational Cloud. Distributed storage systems. Peer-to-Peer systems. Software defined Networks.

II Required Coursework and Background

Pre-requisite(s): CS 3800 or consent of instructor.

III Expected Outcomes

On successful completion of this course, students will be able to:

1. Gain an understanding of the principles and techniques behind the design of distributed systems, such as naming, synchronization and consistency.
2. Identify the security challenges faced by distributed systems programs, and select appropriate solutions.
3. Comprehend the mechanisms of some popular distributed systems such as peer-to-peer systems and software defined networks.
4. Gain practical experience in designing, implementing, and debugging real distributed systems.

Outcomes of this course will build student capacity in each of the following areas as defined by programmatic objectives for the computer science major.

P-SLO 2. An ability to comprehend and apply the state-of-the-art concepts and design principles in advanced computer architecture.

IV Instructional Materials

Texts may vary with instructor and over time. Examples of possible texts include:

**Distributed Systems: Concepts and Design. George Coulouris, Jean Dollimore, Tim Kindberg and Gordon Blair,** Fifth Edition, Addison Wesley, May 2011, ISBN 0-13-214301-1.

V Minimum Student Material

Course textbooks

VI Minimum College Facilities

Computer laboratories, library, Blackboard, classroom with a projection system

VII Course Outline

Distributed systems models

Distributed naming.

Synchronization.

Consistency.

Fault tolerance and security.

Grid computing and computational cloud.

Distributed storage systems.

Peer-to-Peer systems.

Software defined Networks.

VIII Instructional Methods

Lecture

Problem-solving

Discussion

Project-based learning

In class presentations

Small group activities

IX Evaluation of Outcomes

A. Student Assessment

i Class participation

iii. Programming projects

iv mid-term

v quizzes

B. Meaningful Writing Assignment

Students shall produce written solutions or programs to problems that are assigned as homework and/or programming projects and explain their reasoning.

Short answer essay questions on exams will require students to explain and justify their response in writing.

C. A Matrix of Course Student Learning Outcomes vs Methods of Assessment

If the course is being evaluated for accreditation purposes, approved department accreditation assessment tools will additionally be utilized.

|  |  |  |  |
| --- | --- | --- | --- |
| Course Learning Outcomes | Methods of Assessment | | |
| Class Participation | Programming Projects | Exams |
| Gain an understanding of the principles and techniques behind the design of distributed systems, such as naming, synchronization and consistency. | x |  | x |
| Identify the security challenges faced by distributed systems programs, and select appropriate solutions. | x |  | x |
| Comprehend the mechanisms of some popular distributed systems such as peer-to-peer systems and software defined networks. | x |  | x |
| Gain practical experience in designing, implementing, and debugging real distributed systems. | x | x |  |