

INST 346 - TECHNOLOGIES, INFRASTRUCTURE AND ARCHITECTURE

Section: 0101

Meeting Days and Times: Tuesday- Thursday

Location: PHY 1204

Instructor: Christopher Ajiri

E-mail: cajiri@umd.edu

Office: TBA

Office Hours: TBA

Catalog Description

Pre- or co-requisite: INST 201 Introduction to Information Science, AND pre-requisite: INST 326 Object-Oriented Programming for Information Science, AND INST 327 Database Design and Modeling.

This course examines the basic concepts of local and wide-area computer networking including an overview of services provided by networks, network topologies and hardware, packet switching, client/server architectures, network protocols, and network servers and applications. The principles and techniques of information organization and architecture for the Web environment will be covered along with such topics as management, security, authentication, and policy issues associated with distributed systems.

Extended Course Description

Information technology has permeated every aspect of economic and social lives of present-day societies. It is critical for information professionals to understand the fundamental concepts and paradigms on which the current information technology infrastructure stands. This course will introduce different aspects of the contemporary digital information technology infrastructure.

The course will introduce the software and hardware components of client machines such as personal computers and handheld devices; servers used for a variety of purposes such as file transfer and storage, database access and remote computing; as well as topologies and protocols used in network structures. Paradigms and methods for securing data and information, and approaches to enforcing information policies, such as authentication will also be introduced in this course. The course will make use of case studies to introduce the concepts and skills covered.

Student Learning Outcomes

Upon completion of the course, students will be able to:

- Articulate major hardware, software and networking concepts and components that make up the contemporary digital information infrastructure;
- Identify and use approaches to building and maintaining computer networks;
- Apply methods for transferring, storing, compressing, replicating and retrieving data;
- Articulate contemporary network architectures;

- Identify contemporary threats to information security and develop effective approaches to addressing those threats;
- Select and use appropriate approaches to data security, encryption and authentication.

Course Activities

- *Quizzes*

There will be 11 quizzes over the semester, each of which will include 10 to 15 questions and practical tasks related to the concepts and skills covered in the course. The quizzes are “individual work.” That means that the students are not allowed to receive any help from classmates and other individuals.

- *Team Analysis Group Project*

Students will work in groups of 5 student teams to study a technology article related to Information technology /infrastructure / architecture perspective and develop some applied solution to one or more of the underlying problems that led to the issue if applicable. The students will research the causes and the progression of the problem, suggested and applied interventions, and the (successful or unsuccessful) resolution of the subject matter. Student will also develop their own alternative intervention based on technology /infrastructure / architecture solutions available. The deliverables will include a class presentation. Students will be asked to form their own groups, but the instructor may also place students into groups.

- *Team Analysis*

Students will respond to a minimum of 5 of the presentations by their pers with a minimum of a 200 word response. You will **NOT** get the 5% score if you do not respond to a minimum of the 5 Presentations.

- *Mid-term Exam*

A mid-term exam will be administered to test the students’ understanding of the concepts introduced in the course. The mid-term exam consists a variety of multiple choice type questions.

- *Final Exam*

A final exam exam will be administered to test the students’ understanding of the concepts introduced in the course. The mid-term exam consists a variety of multiple choice type questions.

Grading

Course grades will be assigned based on assignments, the term project, the midterm exam, and the final exam. Scores on each component will be combined to produce a single overall score for each student as follows:

Component	Percentage
Quizzes	30%
Team Analysis	20%
Student Team Analysis Reaction	5%
Mid-term Exam	20%
Final Exam	25%

Final grades will be assigned using the following categories:

Percentage	Grade
95-100	A
90-94	A-
87-89	B+
83-86	B
80-82	B-
70-79	C
69 and Below	F

Policy on Academic Misconduct

Cases of academic misconduct will be referred to the Office of Student Conduct irrespective of scope and circumstances, as required by university rules and regulations. It is crucial to understand that the instructors do not have a choice of following other courses of actions in handling these cases. There are severe consequences of academic misconduct, some of which are permanent and reflected on the student's transcript. For details about procedures

governing such referrals and possible consequences for the student please visit <http://osc.umd.edu/OSC/Default.aspx>.

It is very important that you complete your own assignments, and do not share any files or other work. The best course of action to take when a student is having problems with an assignment question is to contact the instructor. The instructor will be happy to work with students while they work on the assignments.

University of Maryland Code of Academic Integrity

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://shc.umd.edu/SHC/Default.aspx>.

Special Needs

Students with disabilities should inform the instructor of their needs at the beginning of the semester. Please also contact the Disability Support Services (301-314-7682 or <http://www.counseling.umd.edu/DSS/>). DSS will make arrangements with the student and the instructor to determine and implement appropriate academic accommodations. Students encountering psychological problems that hamper their course work are referred to the Counseling Center (301-314-7651 or <http://www.counseling.umd.edu/>) for expert help.

Course Schedule

The course meets twice a week for 75 minutes per session.

Date	Topics
Tuesday, August 28, 2018	Introduction and overview
Thursday, August 30, 2018	Computer hardware
Tuesday, September 4, 2018	Network Hardware
Thursday, September 6, 2018	Operating System
Tuesday, September 11, 2018	Storage
Thursday, September 13, 2018	Compression, Virtualization
Tuesday, September 18, 2018	Hadoop, Distributed System
Thursday, September 20, 2018	Client/Server Architecture
Tuesday, September 25, 2018	Network Topologies
Thursday, September 27, 2018	Types of Network (Ethernet, Intranet, WIFI)
Tuesday, October 2, 2018	TCP/IP
Thursday, October 4, 2018	SSL
Tuesday, October 9, 2018	Internet
Thursday, October 11, 2018	Midterm Review

Tuesday, October 16, 2018	Midterm Exam
Thursday, October 18, 2018	
Tuesday, October 23, 2018	
Thursday, October 25, 2018	Data Architecture
Tuesday, October 30, 2018	Cloud Computing Infrastructure
Thursday, November 1, 2018	Data Centers
Tuesday, November 6, 2018	Internet Governance
Thursday, November 8, 2018	Cyber-attacks, security, Malware
Tuesday, November 13, 2018	Encryption
Thursday, November 15, 2018	Wireless Encryption and VPN
Tuesday, November 20, 2018	Access Controls
Thursday, November 22, 2018	Thanksgiving Break
Tuesday, November 27, 2018	Firewalls
Thursday, November 29, 2018	Intrusion Detection systems
Tuesday, December 4, 2018	Backups and Recovery (When all controls Fail)
Thursday, December 6, 2018	Information governance
Tuesday, December 11, 2018	Emerging Technologies
Thursday, December 13, 2018	Final Exam Review/Final Exam