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Syllabus

CS 11B Technology & Computing Components II

School of Technology & Computing

3 Credits, Graduate Course
Effective Date: Fall 2023

Access to the Internet is required.
All written assignments must be in Microsoft-Word-compatible formats.
See the library's APA Style Guide tutorial for a list of resources that can help you use APA style.

Faculty Information

Professional experience information for instructors can be found under Content → Syllabus, Schedule, and Course Team → Meet Your Instructor in the online course menu.

Contact Information

Contact information for instructors can be found in the online course menu. Additional contact information regarding the TA for the course, the Program Manager, Program Director and Dean is also shared in the same location. Hyperlinks on the contact page direct students to the responsible party's weekly office hours.

Course Description

This course introduces students to a review of the fundamentals of technology and computing for graduate and doctoral studies. It covers the areas of networking and operating systems. The students understand the fundamental concepts and earn diverse computing skills with an emphasis on cloud computing and cybersecurity. After taking this course, students will be prepared to perform well in the STC graduate and doctoral programs.

Course Resources

Required and recommended resources to complete coursework and assignments are found on the course Reading List. The reading list can be found under Course Information in Brightspace as well as from the library homepage.

Note: Required resources that must be purchased by the student are tagged “Purchase from a vendor of your choosing.” Required resources with a direct link, “Available through CityU Library”, are available at no cost to students.

Students in Canada will see required resources they need to purchase tagged “Purchase from the Canadian Bookstore.” Students outside the U.S. and Canada should contact their advisor or textbook coordinator for additional information.

Course Outcomes

As a result of this course, students will know or be able to do the following:

1. Understand the fundamentals of networking.
2. Understand the fundamentals of operating systems.
3. Understand the fundamentals of cloud computing for networking and operating systems.
4. Understand the fundamentals of cybersecurity in networking and operating systems.

Additional Information

Topics include:

- Module 1: The OSI Model & Foundations of BASH 1
  - The OSI Model
    - Utilize is a network protocol analyzer, Wireshark, to review network traffic.
    - Review several layers of the OSI model.
    - Describe the encapsulation process and the function of specific protocols that operate within layers of the OSI model.
  - Foundations of BASH 1
    - Explore BASH features like man pages and history.
    - List the contents of directories, including using file globbing.
- Module 2: Types of Network & Foundations of BASH 1
  - Types of Networks
    - Compare and contrast the characteristics of network topologies, types, and technologies.
    - identify common functions of peer-to-peer and client/server networks. Students will create and access file and print shares as well as access a web and File Transfer Protocol server.
  - Foundations of BASH 1
    - Copy, move, and delete files and directories.
    - Use shell variables.
- Module 3: IPv4 vs. IPv6 & Foundations of BASH 2
  - IPv4 vs. IPv6
    - Compare Internet Protocol (IP)v4 and IPv6 addressing concepts such as subnetting, configuration, and testing.
    - Assign addresses, test connectivity, and examine the results.
  - Foundations of BASH 2
    - Perform shell redirection.
- Module 4: TCP/IP Core Protocols & Foundations of BASH 2
  - TCP/IP Core Protocols
    - Review protocols that operate at the internetwork and transport layers of Transmission Control Protocol/Internet Protocol (TCP/IP)- Resolution Protocol (ARP), Internet Control Message Protocol (ICMP), and Internet Protocol (IP), and transport layer protocols such as User Datagram Protocol (UDP) and Transmission Control Protocol (TCP).
    - Review Internet Protocol (IP) address configurations, discover facts about network communication using ICMP and the ping utility.
    - Examine the TCP/IP layers and become familiar with their status and function on a network.
  - Foundations of BASH 2
    - Search for files on the system.
- Module 5: TCP/IP Utilities & Foundations of BASH 3
  - TCP/IP Utilities
    - Identify common commands used to gather information about nodes on a network.
    - Execute these commands in both Windows and Linux environments to compare and contrast their commands and outputs.
  - Foundations of BASH 3
    - Create archive files using tar, cpio, and dd.
- Module 6: Linux Installation & Foundations of BASH 3

    - Linux Installation
        - Perform an Ubuntu Desktop Linux installation.
    - Foundations of BASH 3
        - Compress and uncompress files using gzip, gunzip, and bzip2.
- Module 7: Booting/Restarting & Foundations of BASH 4
    - Booting/Restarting
        - Learn how to enter the GRUB menu during boot, modify the default runlevel, view log files, terminate processes, and shut down the system.
    - Foundations of BASH 4
        - Use various commands to display the contents of text files.
- Module 8: File Management & Foundations of BASH 4
    - File Management
        - Learn how to manage permissions, manage file ownership, and administer links on a Linux system.
    - Foundations of BASH 4
        - Use various commands to display the contents of text files.
- Module 9: Account Management & Foundations of BASH 5
    - Account Management
        - Learn how to use/manage user and group accounts.
    - Foundations of BASH 5
        - Create simple shell scripts.
- Module 10: Network Configuration & Foundations of BASH 5
    - Network Configuration
        - Learn how to configure a Linux system to connect to a network.
    - Foundations of BASH 5
        - Create shell scripts with conditional execution.

Grading Scale

The grades earned for the course will be calculated using City University of Seattle's decimal grading system, found in the current University Catalog (https://www.cityu.edu/catalog/).

Grading rubrics with details on how each assignment will be graded are located under *Grades* from the main bar in the online course menu. Students should review the rubric for each assignment prior to completing their work to understand how it will be assessed.

OVERVIEW OF REQUIRED ASSIGNMENTS	% OF FINAL GRADE	POINTS
Instructor Determined Assignments	***20%***	
The Muddiest Point (MP)	5%	50 = 5 points * 10 modules
Concept Debates (CD)	5%	50 = 5 points * 10 modules
Knowledge Check (KC)	10%	100 = 10 points * 10 modules
Major Assessments	***80%***	
Hands-On Skills (HOS)	30%	300 = 60 points * 5 modules
Virtual Labs (VL) • Networking • Operating Systems	50%	500 = 50 points * 10 modules
TOTAL	**100%**	**1,000 points**

Course Assignments and Grading

The instructor will provide grading rubrics explaining how this assignment will be graded.

The Muddiest Point (MP) & Concept Debate (CD)

All classes are required to use the Discussion Board to participate in MP and CB. Participation is an integral part of this course. It is defined as active engagement in discussing the MP and CB.

A student posts an answer to a weekly discussion topic on Discussion Board. The student also posts a response to two other students' posts by the end of each module. Comments and questions should be clear and thoughtful, with correct grammar, spelling, and punctuation. The instructor will grade the quality of your discussion postings on both content and response. References for your answers are strongly recommended. But APA styles are required for references and citations.

Although your postings' tone can be informal, your instructor will expect the content to be professional. Your comments and questions for discussion should be clear and thoughtful, with correct grammar, spelling, and punctuation. As with written assignments, your discussion postings' quality will be graded on both content and presentation.

MP: Before class, students are required to submit the Muddiest Point (MP) activity. The purpose of this activity is to stimulate student engagement. The instructor uses the MP to assess how students understood the required readings. The instructor also uses the MP to customize the lecture scope to implement Just-in-Time Teaching (JiTT). The MP consists of writing a brief reflective essay (<= 50 words) identifying the most confusing part (i.e., the MP) of the content covered in the upcoming module. If a student understands all concepts, the student needs to explain the most exciting aspect.

Criteria	***% of Grade***
Participation	80%
Writing	20%
TOTAL	**100%**

CD: The instructor poses a problem based on the key concepts of a lecture. After reflecting on the problem, students submit their first answer with justification (<= 50 words) identifying why the answer is correct. Then, students discuss their responses with their classmates. Students discuss their thought processes and solution with peers. Students then commit to an answer and re-submit their responses. The instructor reviews responses and thought processes with the correct answer through Weekly Announcements.

Criteria	***% of Grade***
Participation	80%
Writing	20%
TOTAL	**100%**

Hands-On Skill (HOS)

The instructor will assign hands-on skill exercises to a pair of students in class. Students pair up and practice exercises to learn specific programming languages, application programming interfaces (APIs), or tools related to programming assignments or virtual labs. Two quizzes measure hands-on skills acquired. Each HOS will take 2%.

- HOS01: Using the BASH Shell - 1
- HOS02: Using the BASH Shell - 2
- HOS03: Using the BASH Shell - 3
- HOS04: Using the BASH Shell - 4
- HOS05: BASH Scripting

Criteria	***% of Grade***
Skill Exercise	70%
Engagement	20%
Correctness	10%
TOTAL	**100%**

Virtual Lab (VL)

Students complete cloud-based labs that support networking and operating systems. Through the networking VLs, students study the specific network standards, components, and requirements of network protocols within a distributed computing setting and the characteristics of various communication protocols. In operating systems VLs, students learn how an operating system functions, how it manages the operation of a computing device and system administration principles. VLs involve viewing instructional documents and following systematic instructions. Activities are embedded within each lab. The activities present a challenge to complete. Each lab is graded on accuracy and writing. A student has unlimited attempts at each lab to increase their accuracy and learn the required skills. Reports submitted include a write up on their understandings and findings in their lab reports.

Networking

- VL01: The OSI Model
- VL02: Types of Networks
- VL03: IPv4 vs IPv6 – Calculating, Configuring, and Testing
- VL04: TCP/IP Protocols - The Core Protocols
- VL05: TCP/IP Utilities

Operating Systems

- VL06: Ubuntu Desktop Linux Installation 12.04
- VL07: Booting and Restarting the System
- VL08: Working with Files
- VL09: User and Group Accounts
- VL10: Basic Network Configuration

VL Criteria	*% of Grade*
Accuracy	80%
Writing	20%
TOTAL	**100%**

Knowledge Check (KC)
Weekly quizzes measure knowledge concepts acquired. Focus on the underlying principles and concepts rather than memorization to solve the quizzes. You can try to answer the KC at most twice.

Criteria	*% of Grade*
Correctness	100%
TOTAL	**100%**

Course Policies

Course policies on topics such as Late Assignments, Participation, and Professional Writing are found Content → Syllabus, Schedule, and Course Team → Course Policies in the online course menu. Students are responsible for reviewing and applying these policies while enrolled in this course.

University Policies

Students are responsible for understanding and adhering to all of City University of Seattle's academic policies. The most current versions of these policies can be found in the University Catalog that is linked from the CityU Web site.

Antidiscrimination
City University of Seattle and its staff and faculty are committed to supporting our students. We value equity, diversity, and inclusion as a way of life as well as the educational opportunities it provides. City U will not tolerate any form of discrimination based on race, color, ethnicity, sexual orientation, gender identification, socioeconomic status, or religious values. If you have experienced any discrimination based on any of the above, we encourage you to report this to the University. Please report this to your instructor. If you do not feel safe reporting this to your instructor, please report to Interim Provost or to the Vice President of Student Affairs, Dr. Melissa Mecham.

Non-Discrimination & Prohibition of Sexual Misconduct
City University of Seattle adheres to all federal, state, and local civil rights laws prohibiting discrimination in employment and education. The University is committed to ensuring that the education environment is bounded by standards of mutual respect and safety and is free from discriminatory practices.

In the U.S., the University is required by Title IX of the Education Amendments of 1972 to ensure that all of its education programs and activities do not discriminate on the basis of sex/gender. Sex include sex, sex stereotypes, gender identity, gender expression, sexual orientation, and pregnancy or parenting status. Sexual harassment, sexual assault, dating and domestic violence, and stalking are forms of sex discrimination, which are prohibited under Title IX and by City University of Seattle policy. City University of Seattle also prohibits retaliation against any person opposing discrimination or participating in any discrimination investigation or complaint process internal or external to the institution. Questions regarding Title IX, including its application and/or concerns about noncompliance, should be directed to the Title IX Coordinator. For a complete copy of the policy or for more information, visit https://www.cityu.edu/about-cityu/student-right-to-know/ or contact the Title IX Coordinator.

In Canada, in compliance with the British Columbia Human Rights Code, the Alberta Human Rights Act, WorksafeBC, and the Workers' Compensation Board of Alberta, the University believes that its environment should always be supportive and respectful of the dignity and self-esteem of individuals. Discrimination, harassment and bullying conduct, whether through person to person behaviors or via electronic communications such as email or social media is not acceptable and will not be tolerated. As an educational institution, it is our responsibility to cultivate an environment of excellence, equity, mutual respect and to recognize the value and potential of every individual. The University will take all necessary steps to meet or exceed the requirements of the law to prevent discrimination, harassment and bullying. The Respectful Workplace Policy for the prevention of discrimination, harassment and bullying policy and procedure can be found at https://www.cityu.edu/discover-cityu/about-cityu/ under the Policies section or at https://www.cityuniversity.ca/about/.

Title IX Statement

City University of Seattle and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If students have encountered any form of sexual misconduct (e.g., sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage them to report this to the University. If a student speaks with a faculty member about an incident of misconduct, that faculty member must notify CityU's Title IX coordinator and share the basic fact of the experience. The Title IX coordinator will then be available to assist students in understanding all the options and in connecting students with all possible resources on and off campus.

To view CityU's sexual misconduct policy and for resources, please visit the Title IX and Campus Safety pages in the my.cityu.edu portal.

Religious Accommodations

Washington state law requires that City University of Seattle develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The University's policy, including more information about how to request an accommodation, is available in the University Catalog. Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request Form found on the student dashboard in the my.cityu.edu student portal.

Academic Integrity
Academic integrity in students requires the pursuit of scholarly activity that is free from fraud, deception and unauthorized collaboration with other individuals. Students are responsible for understanding CityU's policy on academic integrity and adhering to its standards in meeting all course requirements. A complete copy of this policy can be found in the University Catalog under *Student Rights and Responsibilities* on the page titled *Academic Integrity Policy.*

Attendance
Students taking courses in any format at the University are expected to be diligent in their studies and to attend class regularly.

Regular class attendance is important in achieving learning outcomes in the course and may be a valid consideration in determining the final grade. For classes where a physical presence is required, a student has attended if they are present at any time during the class session. For online classes, a student has attended if they have posted or submitted an assignment. A complete copy of this policy can be in the University Catalog under *Student Rights and Responsibilities* on the page titled *Attendance.*

Final Assignments Due Date
Final assignments for each class at CityU must be due on or before the final date of the course as indicated in the university's course information system. Due dates that extend beyond the final date of the course may negatively impact tuition funding for students.

Support Services

Disability Services Accommodations Statement
Students with a documented disability who wish to request academic accommodations are encouraged to contact Disability Support Services to discuss accommodation requests and eligibility requirements. Please contact Disability Support Services at *disability@cityu.edu* or 206.239.4752 or visit the Disability Support Services page in the my.cityu.edu portal. Confidentiality will be observed in all inquiries. Once approved, information about academic accommodations will be shared with course instructors.

Library Services
CityU librarians are available to help students find the resources and information they need to succeed in this course. Contact a CityU librarian through the Ask a Librarian service, or access library resources and services online, 24 hours a day, seven days a week.

Online Tutoring
CityU students have access to free online tutoring offered through Brainfuse, including writing support, from certified tutors 24 hours a day, seven days a week. Visit the Brainfuse page on the my.cityu.edu portal for more information.