THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

Course Number: ACS-2906-050, ACS-2906L-070, ACS-2906L-072
Course Name: Computer Architecture and System Software
Course Webpage: nexus.uwinnipeg.ca

Instructor Information

Instructor: William Gidzak
E-mail: w.gidzak@uwinnipeg.ca
Office Hours: Mondays – By Appointment 3:00 –5:00 pm
Office: 3C07

Class meeting time:		Mondays	6 - 9 pm	**Room:**	3D04
Lab time:	L-070	Fridays	1:30-2:45 pm	**Room:**	3D03
	L-072	Wednesdays	4:00- 5:15 pm	**Room:**	3D03

Important Dates

1.	First Class:		Monday, September 9, 2019
2.	First Lab:		Friday, September 13, 2019
3.	Midterm Test 1:		Monday, September 30, 2019
4.	Reading Week (no classes):		October 13-19, 2019
5.	Midterm Test 2:		Monday, November 4, 2019
6.	Final Withdrawal Date w/o academic penalty*:		Tuesday, November 12, 2019
7.	Last Class:		Monday, December 3, 2019
8.	Last Lab:		Friday, November 29, 2019
9.	Final Exam (Comprehensive):		December 16, 2019
10.	University closures:	Thanksgiving	Monday, October 14, 2019
		Remembrance Day	Monday, November 11, 2019

*A minimum of 20% of the work on which the final grade is based will be evaluated and available to the student before the voluntary withdrawal date.

Course Objectives / Learning Outcomes

The course begins with discussions of the architecture of computer hardware and progresses to an examination of system software, including its relationship to the hardware, its structure and design, and its impact on application software, system developers, and end-users. Operating system concepts such as memory management, process management, and I/O subsystems will be covered. Students will also gain hands on experience in assembly programming language during laboratories and on assignments. Other topics include language processors, system utilities, security issues, performance management, program optimization, and GPU programming.

Assignments (20%)

Assignments: There will be five assignments, each worth 4% of your final grade. Submission procedure and other requirements will be stated in individual assignments.

Late Penalties: A late penalty of 15% a day (for a maximum of 3 days) will be imposed. After 3 days the student will not receive any marks for the assignment. NO EXCEPTIONS without medical certificate.
No handwritten assignments will be accepted for evaluation, unless otherwise stated.

Midterm Tests (30%)

There will be two midterm tests (each test is worth 15% of final mark). Midterm tests will be held during at the beginning of the regular class time on dates as indicated in the Important Dates earlier in this outline..

Laboratories (10%)

11 of the 12 laboratories will be evaluated (since the midterm is scheduled during a lab period). Each student can drop his or her worst laboratory mark. Thus, the final grade will be determined by your 10 best reports, each worth 1% of your final grade.

Final Exam (40%) - December 16, 2019, The final examination is comprehensive.

Lab/assignment submissions:
All work is to be submitted electronically. All coding is to be submitted in .java format, and any written work in PDF format. Further details and submission procedure will be stated in each assignment.

Students are responsible for backing up and protecting their lab and assignment work.

Students should contact the instructor as soon as possible if extenuating circumstances require missing a lab, assignment, test or examination. A medical certificate from a practicing physician may be required before any adjustments are considered.

Test / Exam Requirements

Photo ID is required.
Electronic translators and any electronic / hand held devices are not allowed.
Unless a medical certificate is provided, no accommodation is made for missed exams.

Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., note-takers) are encouraged to contact Accessibility Services (AS) at 786-9771 or accessibilityservices@uwinnipeg.ca to discuss appropriate options. All information about a student's disability or medical condition remains confidential.
http://www.uwinnipeg.ca/accessibility.

Final Letter Grade Assignment

Historically, numerical percentages have been converted to letter grades using the following scale. However, instructors can deviate from these values based on pedagogical nuances of a particular class, and final grades are subject to approval by the Department Review Committee.

Assignments will be graded in the following manner:

A+ 90 – 100%	A- 80 – 84%
A 85 – 89 %	B+ 75 – 79%

B 70 – 74%
C+ 65 – 69%
C 60 – 64%
D 50 – 59%
F below 50%

Required Text Book / Reading List

Main text: Computer Systems: A Programmer's Perspective; 3rd Edition; Randel E. Bryant, David R. O'Hallaron; Prentice Hall 2010, ISBN: 978-0134092669

Besides the information contained in the textbook, I may also discuss appropriate material and examples from other sources. Students are responsible for all material covered in the class.

A course web site has been created in U of W NEXUS student learning system. It is expected that students will be:

- able to access their email and Nexus accounts and the Internet on a daily basis.
- able to search and validate information on the Internet effectively.
- familiar with word processors, spreadsheets and presentation software.
- confident in using computers and willing to explore old and new applications.

Note: The Instructor will, as much as possible, facilitate student learning in any of the above areas, but not to the detriment of the course objectives. Students will need to develop of the understanding of how their devices work and be able to troubleshoot issues that arise. The Instructor will not be troubleshooting specific student devices and related applications on said device.

Prerequisite Information *

(This information can be found in the UW CourseCalendar)
A grade of at least C in ACS-1904/3 or ACS-1905/3.
*Make sure that you have the necessary prerequisites to take this course.
• ACS-2906L -70 or ACS-2906L-72 (lab) must be taken concurrently

Services for Students

Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., note-takers) are encouraged to contact Accessibility Services (AS) at 204-786-9771 or accessibilityservices@uwinnipeg.ca to discuss appropriate options. All information about a student's disability or medical condition remains confidential.
https://www.uwinnipeg.ca/accessibility-services.

Students may choose not to attend classes or write examinations on holy days of their religion, but they must notify their instructors at least two weeks in advance. Instructors will then provide opportunity for students to make up work examinations without penalty. A list of religious holidays can be found in the 2019-20 Undergraduate Academic Calendar online at
http://uwinnipeg.ca/academics/calendar/docs/important-notes.pdf

All students, faculty and staff have the right to participate, learn, and work in an environment that is free of harassment and discrimination. The UW Respectful Working and Learning Environment Policy may be found online at https://www.uwinnpeg.ca/respect.

Misuse of Computer Facilities, Plagiarism, and Cheating

Academic dishonesty is a very serious offense and will be dealt in accordance with the University's policies.

Avoiding Academic Misconduct and Non-academic Misconduct. Students are encouraged to familiarize themselves with the Academic Regulations and Policies found in the University Academic Calendar at:
https://uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf
Particular attention should be given to subsections 8 (Student Discipline), 9 (Senate Appeals) and 10 (Grade Appeals). Please note, in particular, the subsection of Student Discipline pertaining to plagiarism and other forms of cheating.

Detailed information can be found at the following:

- Academic Misconduct Policy and Procedures: https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-policy.pdf and https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-procedures.pdf
- Non-Academic Misconduct Policy and Procedures: https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-policy.pdf and https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-procedures.pdf

Misuse of Filesharing Sites. Uploading essays and other assignments to essay vendor or trader sites (filesharing sites that are known providers of essays for use by others who submit them to instructors as their own work) involves "aiding and abetting" plagiarism. Students who do this can be charged with Academic Misconduct.

Avoiding Copyright Violation. Course materials are owned by the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, and presentation slides. Students who upload these materials to filesharing sites, or in any other way share these materials with others outside the class without prior permission of the instructor/presenter, are in violation of copyright law and University policy. Students must also seek prior permission of the instructor /presenter before photographing or recording slides, presentations, lectures, and notes on the board.

Class Cancellation, Correspondence with Students and Withdrawing from Course

When it is necessary to cancel a class due to exceptional circumstances, the course instructor will make every effort to inform students via uwinnipeg email (and/or using the preferred form of communication, as designated in this outline), as well as the Departmental Assistant and Chair/Dean so that class cancellation forms can be posted outside classrooms.
Students are reminded that they have a responsibility to regularly check their uwinnipeg e-mail addresses to ensure timely receipt of correspondence from the University and/or the course instructor.
Please let course instructor know if you plan on withdrawing from the course. Note that withdrawing before the VW date does not necessarily result in a fee refund.

Topics to be covered (tentative)

The following tentative schedule is provided as a guideline for students to help prepare for the sessions. Timelines for topics should be considered a guide only. Topics may expand to be covered over more than 1 class. Time constraints and other unforeseen factors may require that some of the topics be omitted or covered in less detail. Further detail will be given as topics are developed. This will allow some flexibility in approach to address student interests and needs.

- Intro – Computer Hardware Review

- Representing and Manipulating Info
- Integer Arithmetic
- Floating Points
- Assembly Language
- Assembly Language/Memory Hierarchy
- Memory Hierarchy and Overflows
- Hardware Security
- GPUs/Review
- Final Exam - TBA

Note: Due to unforeseen circumstances and time restraints, some of the aforementioned topics may not be covered, or others may be added.