



UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
COURSE OUTLINE

1. **Course:** CPSC 525, Principles of Computer Security -- Winter 2018

Lecture 01: (TR, 15:30-16:45 in ST139)

Instructor Name	Email	Phone	Office	Hours
Philip Fong	pwlffong@ucalgary.ca	403-210-6229	ICT 640	Wednesday 3:00-5:00 PM

Course Site:

Course web site: <http://www.cpsc.ucalgary.ca/~pwlffong/525>

D2L: CPSC 525 L01-(Winter 2018)-Principles of Computer Security

Department of Computer Science: ICT 602, 403 220-6015, cpsc@cpsc.ucalgary.ca

Students must use their U of C account for all course correspondence.

2. **Prerequisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

Computer Science 457 and either Mathematics 271 or 273.
Credit for both Computer Science 525 and 529 will not be allowed.
Computer Science 329 is recommended as preparation for this course.

According to the UofC calendar, the prerequisites for this course are the following: CPSC 457 and one of MATH 271 or 273. CPSC 329 is recommended as preparation for this course.

3. **Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Component(s)	Weighting %
Tutorial Participation	5%
Assignments	40%
Project Proposal	5%
Project Final Report	50%

Each of the above components will be given a letter grade using the official university grading system. The final grade will be calculated using the grade point equivalents weighted by the percentages given above and then converted to a final letter grade using the official university grade point equivalents.

4. **Missed Components of Term Work:**

The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself with these regulations. See also [Section E.3](#) of the University Calendar

5. **Scheduled out-of-class activities:**

There are no out-of-class activities scheduled for this course.

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a conflict with the out-of-class-time-activity, please contact your course coordinator/instructor no later than **14 days prior** to the date of the out-of-class activity so that alternative arrangements may be made.

6. **Course Materials:**

There is no required textbook. All required readings will be available either at the University Library website or at D2L.

A reading list will be made available online at the course website. The list specifies the reading assignment for each of Week 2 to Week 12 (excluding week 7, the Mid-Term Break). Students shall complete the readings on a weekly basis.

7. **Examination Policy:**

There is no scheduled final exam for this course.

Students should also read the Calendar, [Section G](#), on Examinations.

8. **Approved Mandatory and Optional Course Supplemental Fees:**

There are no mandatory or optional course supplemental fees for this course

9. **Writing across the Curriculum Statement:**

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of those reports. See also Section [E.2](#) of the University Calendar.

10. **Human studies statement:**

Students will not participate as subjects or researchers in human studies.

11. **Reappraisal of Grades:**

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

1. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **15 days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a re-assessment of the work if, and only if, the student has sufficient academic grounds. See sections [I.1](#) and [I.2](#) of the University Calendar
2. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

12. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

- a. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/ fabrication of experimental values in a report. **These are only examples.**
- b. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- c. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accomodations-for-students-with-disabilities_0.pdf](#).

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate

degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head of Undergraduate Affairs of the Department of Computer Science, Nathaly Verwaal by email nmverwaa@ucalgary.ca or phone 403-220-8485. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question: <http://www.ucalgary.ca/pubs/calendar/current/e-4.html>

- d. **Safewalk:** Campus Security will escort individuals day or night (www.ucalgary.ca/security/safewalk/). Call [403-220-5333](tel:403-220-5333) for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- e. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPPA). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see also www.ucalgary.ca/legalservices/foip.
- f. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: sciencerep@su.ucalgary.ca. Student Ombudsman, Email: suvpaca@ucalgary.ca.
- g. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
- h. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.
- i. **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see www.ucalgary.ca/wellnesscentre or call [403-210-9355](tel:403-210-9355).

Department Approval:

Electronically Approved

Date: 2018-01-04 07:53

Course Outcomes

1. By the end of the course, students should be able to list three major security models (Biba, Bell-LaPadula, and Clark-Wilson), enumerate the rules defining each model, and identify the standard purpose of each model.
2. By the end of the course, students should be able to explain the genesis of the field of computer systems security by referencing the seminal security literature elucidating those models in addition to the seminal work on protection domains; the students should be able to map the memory protection concepts in the research literature circa 1970 to the memory protection techniques used in modern processors.
3. By the end of the course, the student should demonstrate the operation of common access control mechanisms in operating systems, among others; in addition, students should be able to offer a critique of common access control models like RBAC.
4. By the end of the course, students should be able to explain how coding mistakes lead to specific classes of code injection vulnerabilities; students should be capable of both purposefully writing and exploiting such a weakness; students should be able to list common, deployed countermeasures to code injection attacks.
5. By the end of the course, students should be able to apply the "Security Mindset": a way of thinking about systems that envisions how they can be made to fail by supplying unanticipated input or environmental conditions; the advanced student should be able to hypothesize how such failure states could be customized for external control of the compromised application.
6. Using the Security Mindset, students should be able to critique an arrangement of protection mechanisms, or a system, or program logic; the student demonstrates the validity of such a critique by offering evidence that their crafted input has some correlation with the perceived coding mistake.
7. By the end of the course, students should use common debugging and program analysis tools and frameworks to explain the internal state of programs and systems to an observer and hypothesize how the program or system reached that state, including identifying any cross-layer interactions, composition of trust relationships in the software, and the efficacy or influence of countermeasures.
8. By the end of the course, students should be able to list common static analysis techniques and tools and demonstrate the ability to run such tools on real, large software code. Students should also be able to list common (e.g., NIST) security evaluation standards; the advanced student will be able to list specific evaluation criteria from the appropriate model.
9. By the end of the course, students should be able to use their knowledge of evaluation standards, the Security Mindset, and analysis tools to produce a security review of a product, protection technique, or security mechanism.