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

1. **Course:** CPSC 601.06: Computational Fabrication
   Lecture Sections:
   L06, TR 14:00-15:15, MS 680A, Lora Oehlberg, MS 680H, 220-7711, lora.oehlberg@ucalgary.ca
   Office Hours: TR 15:30-16:30

   Course Website: http://pages.cpsc.ucalgary.ca/~lora.oehlberg/courses/compfab/index.html

   Computer Science Department Office, ICT 602, 220-6015, cpsc@cpsc.ucalgary.ca

2. **Prerequisites:** Consent of the Department
   (http://www.ucalgary.ca/pubs/calendar/current/computer-science.html#3620)

3. **Grading:** The University policy on grading and related matters is described in sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Reading Discussion Participation	20%
Homework Assignments	30%
Course Project	50%

   This course **will not** have a Registrar's Scheduled Final Exam.

   Special Regulations affecting the Final Grade: None.

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. Section 3.6. It is the student's responsibility to familiarize theirself with these regulations. See also Section E.6 of the University calendar.

5. **Scheduled Out-of-Class Activities:** REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME ACTIVITY. If you have a clash with this out-of-class activity, please inform your instructor as soon as possible so that alternative assignments can be arranged.

6. **Course Materials:**
   No required textbook.

   Online Course Components:
   Learning materials will be available online.

7. **Examination Policy:** Not exams. Students should also read the Calendar, Section G, on examinations.

8. **Approved Mandatory and Optional Course Supplemental Fees:** None.

9. **Writing across the Curriculum Statement:** In this course, the quality of the student's writing in the weighted components of the course will be a factor in the evaluation of these components. See also Section E.2 of the University Calendar.

10. **Human Studies Statement:** Students will be expected to participate as subjects or participants in projects. See also Section E.5 of the University Calendar.

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

a) **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offense 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.

b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on assembly points which can be found in each classroom and building.

c) **Student Accommodations:** 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 http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf. Students needing an Accommodation in relation to their coursework or to fulfil 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 Computer Science.

d) **Safewalk:** Campus Security will escort individuals day or night (http://www.ucalgary.ca/security/safewalk/). Call 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 (FOIPP). As one consequence, 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 http://www.ucalgary.ca/secretariat/privacy

f) **Student Union Information:** VP Academic (403) 220-3911 suvpaca@ucalgary.ca SU Faculty Rep (403) 220-3913 science1@su.ucalgary.ca, science2@su.ucalgary.ca and science3@su.ucalgary.ca, Student Ombuds Office: (403) 220-6420 ombuds@ucalgary.ca, http://ucalgary.ca/provost/students/ombuds

g) **Internet and Electronic Device Information:** You can assume that in all classes that you attend your cell phone should be turned off unless instructed otherwise. All communications with other individuals via laptop computers, cell phones or other devices connectable to the internet in not allowed during class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

h) **U.S.R.I.:** At the University of Calgary feedback provided by students through the Universal Student ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference – please participate in USRI surveys.

Department Approval_____Date_____

Associate Dean's Approval for
out of regular class-time activity: _____Date:_____

Associate Dean's Approval for
Alternate final examination
arrangements:_____Date:_____

A signed copy of this document is kept on file in the Computer Science main Office ICT 602

CPSC 601.06 Percentage to Letter Grade Conversion Table

A+	95-100
A	90-94
A-	85-89
B+	80-84
B	75-79
B-	70-74
C+	65-69
C	60-64
C-	55-59
D+	50-54
D	40-49
F	0-39

CPSC 601.06 Syllabus

Tentative Topics Covered

- **Designing for Digital Fabrication.** Students will cycle through a series of basic digital prototyping machines – machines that operate from 3D and 2D design files, and machines that operate using additive, subtractive, and formative approaches to fabrication. Students will also learn how to develop and computationally generate designs for fabrication (e.g., OpenSCAD).
- **Controlling Digital Fabrication Machines.** Students will learn how to program for the underlying control systems that govern the operation of digital fabrication machinery (e.g., GCode for CNC Milling and 3D printing). Students will consider both fabrication (e.g., alternative non-layered approaches to 3D printing) and non-fabrication (e.g., musical) application of such controls.
- **Interacting with Digital Fabrication.** Students will develop interactive systems that enhance the holistic, human process of fabrication. Issues include bringing direct manipulation back into digital fabrication, supporting distributed or asynchronous collaboration during fabrication, authoring documentation for design or assembly processes, supporting design debugging or troubleshooting, and facilitating knowledge management within maker communities.

Learning Outcomes:

By the end of this course, students should be able to:

- Author and edit 2D and 3D design files via scripting (e.g., OpenSCAD)
- Describe a designer's complete workflow as they create a physical object using digital fabrication equipment (e.g., 3D printer, 2D cutter, embroidery machine, etc.)
- Analyze and critique research literature on fabrication from the HCI and Graphics research communities.
- Propose a research project that extends a users' fabrication capabilities, and successfully design, develop, and communicate the research project findings to others.