1. **Course:** CPSC 587: Fundamentals of Computer Animation  
   CPSC 687: Computer Animation

   **Lecture Sections:**  
   L01, TR 14:00-15:15, SA 247, Dr. Prusinkiewicz, MS 622, 220-5494, pwp@ucalgary.ca  
   Office Hours: TR 15:30-16:30

   **Course Website:** [http://algorithmicbotany.org/courses/CPSC587/Fall2015/](http://algorithmicbotany.org/courses/CPSC587/Fall2015/)  
   (Password will be announced in class)

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

2. **Prerequisites:** CPSC 587: CPSC 453  
   CPSC 687: Consent of the Department  
   ([http://www.ucalgary.ca/pubs/calendar/current/computer-science.html#3620](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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Weight (as %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPSC 587</td>
<td>Assignments (4)</td>
</tr>
<tr>
<td>CPSC 687</td>
<td>Assignments (4)</td>
</tr>
<tr>
<td></td>
<td>Midterm Examination</td>
</tr>
<tr>
<td></td>
<td>Midterm Examination (In-Class Thursday October 29th, 2015)</td>
</tr>
<tr>
<td></td>
<td>Final Examination</td>
</tr>
<tr>
<td></td>
<td>Final Examination (In-Class Thursday October 29th, 2015)</td>
</tr>
<tr>
<td></td>
<td>Presentation</td>
</tr>
</tbody>
</table>

   This course will have a Registrar's Scheduled Final Exam.

   **Special regulations affecting the final grade (e.g. requirement to pass the final examination or to pass the laboratory to pass the course):** Each of the above components will be given a numerical grade. A corresponding letter grade will be determined using the attached table. The final numerical grade will be calculated using the numerical grades of individual components weighted by the percentages given in the above table and then converted to a final letter grade using the attached table.

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:** None. References to suitable technical/research papers will be provided by the instructor.

   **Online Course Components:** None.

7. **Examination Policy:** Students will be allowed to bring one letter-sized page of notes to both the midterm and final 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 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 Computer Science, Dr. Ben Stephenson, by email bdstephe@ucalgary.ca or phone 403-220-6781.

   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 ____________________________

   *A signed copy of this document is kept on file in the Computer Science Main Office ICT 602*
## CPSC 587/687 Percentage to Letter Grade Conversion Table

<table>
<thead>
<tr>
<th>Numerical grade $x$ [%]</th>
<th>Letter grade</th>
<th>Numerical grade $x$ [%]</th>
<th>Letter grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x &lt; 50$</td>
<td>F</td>
<td>$75 \leq x &lt; 80$</td>
<td>B−</td>
</tr>
<tr>
<td>$50 \leq x &lt; 55$</td>
<td>D</td>
<td>$80 \leq x &lt; 84$</td>
<td>B</td>
</tr>
<tr>
<td>$55 \leq x &lt; 60$</td>
<td>D+</td>
<td>$84 \leq x &lt; 88$</td>
<td>B+</td>
</tr>
<tr>
<td>$60 \leq x &lt; 65$</td>
<td>C−</td>
<td>$88 \leq x &lt; 92$</td>
<td>A−</td>
</tr>
<tr>
<td>$65 \leq x &lt; 70$</td>
<td>C</td>
<td>$92 \leq x$</td>
<td>A</td>
</tr>
<tr>
<td>$70 \leq x &lt; 75$</td>
<td>C+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CPSC 587/687 Syllabus

CPSC 587 / 687 Course Description:

Principles of traditional animation, key framing, parametric and track animation, free form deformation, inverse
kinematics, dynamics, spring mass systems, particle systems, numerical integration, Lagrangian constraints, space
time constraints, collisions, human animation, behavioural animation, metamorphosis, implicit animation techniques,
amdating liquids, gases and cloth, motion capture.

Topics Covered (Tentative):

History of traditional and computer animation
Animation production
Keyframing and interpolation-based techniques
Particle kinematics
Reference frames
Rotations in three dimensions – application of quaternions
Kinematic animation of articulated structures
Animation of walking
Motion capture and retargetting
Introduction to physically-based animation
Single-particle dynamics, harmonic oscillator, and numerical methods for ODEs
Mass-spring systems and the animation of cloth
Collisions
Position-based dynamics
Smoothed particle hydrodynamics
Behavioral animation and animation of crowds
Video compression and editing