1. **Course:** CPSC 601.24: Theory and Practice of Concept Modeling: Visualization and Analytics
   Lecture Sections:
   L10, TR 15:30-16:45, Mario Costa Sousa, MS 628, 220-6783, smcosta@ucalgary.ca
   Office Hours: By Appointment

   Course Website: http://cpsc.ucalgary.ca/~mario/teaching/601.24

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

2. **Prerequisites:** Consent of 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:

Project	50%
(One in Term, Groups of up to 3 students)	
- Proposal (written/Presentation)	15%
- Progress Reports x2	10%
- Final (Results/Presentation)	25%
Papers/Presentations	50%
- Paper Reviews (Every Week)	10%
- Discussion (Every Week)	10%
- Presenting Papers (Twice during term by student)	25%
- Presenting Traditional Sketching and Illustration 9Twice during term by student)	5%

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

   Special Regulations affecting 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 arrangements can be made.

6. **Course Materials:**
   None.

   Online Course Components:
   Lecture slides, paper, and notes will be available online.

7. **Examination Policy:** No 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_____

Faculty Approval for
out of regular class-time activity: _____
Date:_____

Faculty Approval for
Alternate final examination arrangements: _____
Date:_____

A signed copy of this document is on file in the Computer Science Main Office

CPSC 601.24 Syllabus

<u>Tentative Topics Covered:</u>

In early stages of any design activity, users collaboratively build a range of conceptual models, represented in the form of hand-made sketches and renderings. These models help users formulate ideas, suggest possible solutions, and make important decisions in following design stages. Computational tools to aid the user in this process have their foundations in the fields of sketch-based interfaces and modeling (SBIM), non-photorealistic rendering (NPR), and illustrative visualization (IVIS). These areas introduced a new paradigm leveraging the traditional illustrator's fundamental and applied drawing and rendering skills in different domains of art, science, and engineering. This course will focus on the theory and practice of concept sketching & rendering applied to the problem of modeling, visualizing, and analyzing conceptual models of different domains in science and engineering.

- Fundamental techniques in SBIM, NPR, IVIS, and visual analytics.
- Traditional concept sketching & rendering techniques in different domains (e.g. geoscience, product design, content creation in entertainment, engineering)
- Context-aware sketch uncertainty & progress tracking
- Multi-{view, scale} sketching & rendering
- Shape modeling & optimization
- Rendering the concept sketching & modeling progress
- Rendering for illustrative concept visualizations and analytics
- Demonstration examples from application domains
- Invited talks and discussions with illustrators and concept design professionals

<u>Learning Outcomes:</u>

- New approaches on how concept digital models can be built and visualized.
- Traditional techniques of concept sketching and rendering in different applied domains (science, engineering, art, entertainment)
- Key algorithms and techniques in SBIM, NPR, IVIS, and analytics and how they relate to each other I practice
- Sketching and rendering approaches based on the visual communication goals, the application domains + requirements, and the data modalities + representations.

Allowable Sources:

Course website. Textbooks, research papers in SBIM, NPR and IVIS

Cited Sources:

Research papers, code, traditional illustrations

Level of Collaboration between Students:

Paper reviews and presentation, final course project

Disclosure Policy

If you discuss the assignments with others, make sure to cite these discussions.