COSC150: Scientific Investigations Using Computation
Final project Guidelines
Fall 2023

Expectations:

1. As described in the Course Syllabus, there is a final project required of all students. This project will count as 20% of your final grade and will take approximately 15-20 hours *per person* spread over three weeks for you to produce a quality effort.

2. The focus of your project is *a topic of your own choosing*, for which you will conduct a *scientific investigation using computation*, that is a formal inquiry to uncover the truth of your project, comparing and/or contrasting at least *two different modeling approaches* (numerical, system, agent, etc.). You may find and/or modify/substantially extend existing models including ones from class, or build your own. All sources must be sourced!

3. *The "concrete deliverables" are*

   a. During the scheduled "exam" time, **10-Noon on 14 December 2023**, you will give an in-person clear, concise oral presentation, 10-15 minutes, on your project during which you will run your models and discuss with your classmates the main lessons learned from your scientific investigation. Using a few slides in your presentation may be appropriate. I will be available at 9 am for last hour help.

   b. A 8-10 page paper/report that demonstrates your understanding of your basic science topic and how computation enhances a scientific investigation of that topic. *This paper and accompanying models must be turned in no later than 5 PM 15 December 2023.*

4. You may work alone or in pairs, as long as the tasks are clearly defined in advance for each person, and each person contributes substantially to the project (this project will be pledged). More will be expected, naturally, of group projects.

5. The paper must follow this basic structure:
   a. Introduction of the topic and clear statement of your driving questions;
   b. Description of the computational models used in your exploration to answer your driving questions;
   c. Presentation of typical runs of the models varying different key parameters;
   d. Discussion of lessons learned in trying to answer your driving questions;
   e. Discussion of the limitations and possible extensions of your models;
   f. Conclusions you have drawn about what you have learned in your exploration.

6. The following project progress checkpoints must be met:
   a. **Thursday 16 November 2023**: A *written project proposal* consisting of two or three paragraphs submitted *before 9:30 am class time,* to include:
      i. Proposed topic of your investigation;
      ii. Proposed models to be used/modified/built and identify which modeling tools you expect to use (*e.g.*, Excel, Vensim, NetLogo, AgentCubes, Tools from Interactivate, coding, other?)

iii. Proposed team working on this project including specific roles to be fulfilled by each team member
iv. Projected needs to meet with instructor for guidance and help

You will present your project proposal ideas to the class in person during class time.

b. **Tuesday 28 November 2023 CLASS time (no LAB meeting)**: *Written progress before start of class,* to include
   i. Any modifications to your project proposal
   ii. Description of progress made in background research and
   iii. Description of the model(s) you have identified/used/modified/built
   iv. Projected need to meet with instructor for guidance and help

   Be prepared to present a 3-5 minute progress report during CLASS time.

c. **Thursday 30 November:**
   i. **Class time:** Questions, Comments, Concerns
   ii. Help scheduled Thursday/Friday

d. **Tuesday 5 December 2023**: *Written progress report*, *before 9:30 am class time,* to include:
   i. Any modifications to your project proposal
   ii. Draft of your Introduction and Background text
   iii. Description of progress made in background research and model(s) identified/used/modified/built
   iv. Projected need to meet with instructor for guidance and help

   Be prepared to present a short, 3-5 minute progress report in person during class time. There is no lab on 5 December.

7. I will schedule as much time and as many meetings as needed with the project teams (or you alone, if you are working alone) during all open time all week and even on weekends. I will return to campus by mid-afternoon **Thursday 7 December for in-person help over the weekend.** You and your team *must schedule in-person or specific Zoom sessions* for help through e-mail. All members of your team should be available to meet during these help sessions. This is *your* project, but I am willing to help as much as needed.

8. Questions, comments, concerns?

   Some suggested resources:

a) **Excel starting models: http://www.shodor.org/talks/ncsi/excel**
b) **Vensim starting models: http://www.shodor.org/talks/ncsi/vensim**
c) **Netlogo: web or download a copy https://netlogoweb.org/** (extensive models library)
d) **AgentSheets: search for models at http://agentsheets.com/**