COSC150: Scientific Investigations Using Computation
Final project Guidelines
Fall 2021

Expectations:

1. As described in the Course Syllabus, there is a final project expected of all students. This project will count as 20% of your final grade and will take approximately 10-15 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***, comparing and/or contrasting at least ***two different modeling approaches*** (numerical, system, agent, etc)

3. The "deliverables" are

    a. A 7-10 page paper/report that demonstrates your understanding of the 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 Thursday 5 PM 16 December 2021.***

    b. During the scheduled "exam" time, **9-Noon on 16 December**, you will give in person a 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.

4. You may work alone or in pairs, as long as the tasks are clearly defined 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 should 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. ***Class and Lab time on 30 November in person and 7 December on Zoom for model guidance, topic shaping, and team building.***

7. The following project progress checkpoints should be met:
    a. **Tuesday 30 November**: A ***written project proposal*** consisting of one or two 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 will be using (*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 need to meet with instructor for guidance and help

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

NOTE: ***There is no scheduled class on Thursday 2 December!***

b. **Tuesday 7 December class time**: ***Written progress report***, ***before 9:30 am class time,*** 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 short, 3-5 minute progress report ***over Zoom*** during class time.

c. **Thursday 9 December**: ***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.

8. I will schedule as much time and as many meetings as needed in person or on Zoom with the project teams (or you, if you are working alone) during all open time all week and even on weekends including the normal lab time on **Tuesday 30 November in person and Tuesday 7 December on Zoom**, up to and including **15 December**. You and your team must schedule specific in-person or 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.

9. Questions, comments, concerns?

Some suggestions:

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) AgentCubesOnline: search for models at http://agentsheets.com/