The Covid-19 Pandemic Prevention Design Challenge (CPPDC)

EEE154 Introduction to Engineering Drawing
Group Super Assignment
Due: 11:59pm, 12th May 2020
Faculty: Akid Ornob (AkO)
Department of Electrical & Computer Engineering, North South University

BACKGROUND

As we all know, the Covid-19 pandemic have wreaked havoc across the globe. Bangladesh is at a critical stage as we are starting to experience an exponential rise in the daily number of positive Covid-19 cases. To prevent the spread of this deadly virus and to contain suspected Covid-19 patients, the Government of Bangladesh and the Ministry of Health have taken the decision to construct emergency isolation units across the country. However, the construction of these units at such a short time is tricky and is faced with interesting health challenges. Firstly, the suspected Covid-19 patients need to be isolated in a negative pressure room (Google and figure this out). Secondly, extensive infrastructural facilities need to be designed and implemented within a very short time. Finally, intensive care units (ICUs) equipped with ventilators and other related medical equipment need to be designed. Safety equipment such as personal protective equipment, goggles, surgical masks and N95 respirators are also required. Since we have been learning engineering drawing, we are going to use our skills both as an engineer and as a draftsman to design some of these facilities and equipment

TOPICS

Form a group of 3-4 students and work on any the following topics:

a. Facility design (floor plan) of Covid-19 patient hospital
b. Facility design (floor plan) of negative pressure room isolating Covid-19 patients – sufficient details regarding the mechanism to create a negative pressure inside the room must be drafted
c. 2D drafting of a mechanical ventilator along with detailed labels of relevant parameters
d. Facility design (floor plan) of an intensive care unit (ICU)
e. 3D modeling of a surgical mask/n95 respirator so that it may be 3D printed for real-life use
f. 3D modeling of goggles with design parameters so that it may be 3D printed for real-life use
g. 3D modeling of face shield with design parameters so that it may be 3D printed for real-life use
h. Any other relevant design solutions related to containing the Covid-19 outbreak

TASKS

This project is complicated and requires active imagination and design-thinking. As a result, this will require intense collaboration among the group members. Please discuss continuously over phone, Google Meeting, Zoom, Skype while you keep working on your own. I will be at hand for help at all times (Pease see "Final Thoughts" section below) There are several tasks in these projects and the timelines for these tasks are mentioned below

1. Formation of group and submission of 1 page project proposal – 11:59pm, 22nd April 2020
2. Approval of proposal by consulting with me – 11:59pm, 25th April 2020
3. Project mid-way review – 11:59pm, 4th May 2020
4. Submission deadline – 11:59pm, 12th May 2020
5. Presentation – Date to be announced later

REQUIRED SUBMISSIONS

1. For the project proposal submission:
    a. Names of group members
    b. Topic selection
    c. One paragraph on how you want to implement your design
2. For the mid-way project review:
    a. Screenshots, dwg files showing progress
3. Final submission:
    a. .dwg/drawing files of the design
    b. Description and working principles behind the design (2-4 pages)
4. Presentation:
    a. Ppt slides which will most likely be done online if situation does not improve

GRADING

Although the grade breakdown have not been assigned yet due to the uncertainty of how NSU wants to conduct assessments, here is my overall plan:

1. Attendance – 10%

2. Assessment – 30% (best 6 most likely)
3. Group Super Assignment project proposal – 10%
4. Group Super Assignment drawing file – 30%
5. Group Super Assignment final drawing report – 10%
6. Final group presentation – 10%

There might be some changes, but we will assume the above to be true for now on and will proceed accordingly.

EXCLUSION CRITERIA

There are several students across my three sections who are struggling with online classes either due to having no computers/laptops, or having computers with no AutoCAD installed. These students will be mostly involved in the writing and presentation aspect of the project. Needless to say, they will also be involved in the formulation of the design process but probably cannot participate in the final drawing part due to their limitations. I have prepared a list of these students. **NO TWO STUDENTS FROM THIS LIST CAN BE IN THE SAME GROUP.**

LIST OF STUDENTS WITH INADEQUATE ONLINE FACILITIES AS OF 11 APRIL 2020		
Section 1	**Section 2**	**Section 3**
Quazi Nazmus Sakib	Habibur Rahman	Asaduzzaman
Umme Habiba Nafiya	Kawsar Ahmed	Yeasin Arafat Prantik
Md. Ishtiaque Shahriar	Abdul Gafur Patowary	Rifat Khan Ridoy
Izaj Mohammad Khan	Nurun Naima Tuly	Shefat Ara Moon
Anika Bin Wasim	Md. Jakir Hossain	Jannatul Ferdous Mim
Md. Nazmul Hasan	Md. Elias	Junaid Sadman
Adnan Uddin Chowdhury		Mohammad Sami
Mehnaz Ahmed Easha		Abtahee Ashab Siddiqui
		Ifaz Ajmain

FINAL THOUGHTS

This is a challenging project. But we have to realize that we are living in challenging times. This can be a good opportunity for us engineers and future engineers to come together and brainstorm design solutions to these pressing problems. This will require some studying and hard work. But if we can come up with something workable, we can maybe pitch this ideas to the higher-ups and see what happens. ;)

If nothing else comes out of this, the best group from each section will get Pizza treats from me once normal life resumes. ☺

As this is a challenging problem, I hereby grant everyone the permission to bother me at any times you find suitable. You can reach me at my email akid.ornob@northsouth.edu or call me at **01712182415**.

Best of luck!