**Addis Ababa University**

**Addis Ababa Institute of Technology (AAiT)**

**School of Civil and Environmental Engineering**

**Water Distribution Modeling (CENG – 6404)**

**Assignment 3- FINAL PROJECT (40%)**

The first part in any project is to write the proposal addressing key problems, rationale of the study, methodology, expected results, budget, and timeline. In this assignment, you are expected to write a ***Water Supply Modeling/Design*** project. Pick any water distribution design and operation (performance) **issue or topic** for which application of WaterCAD/ EPANET/GIS tools would be useful and prepare a proposal. Your proposal should include the following components:

1. **Background**: What is the history of the problem? What do we know about the problem? What is the current situation? Why worth researching the problem? How important is the *hydraulic* context of the problem, and what makes it suitable for analysis with a *WaterCAD/ EPANET/GIS* (or any convinient data analysis tool)?
2. **Literature Review**: Summarize prior research on this topic or related topics, including any advanced water distribution modeling methods. Review the strengths and limitations of some representative prior studies (eg. Optimization, network analysis). You may use existing design documents in your study area.
3. **Hypotheses**: What specific questions are you trying to answer? What is the rationale of the study? What makes your study different and superior than others?
4. **Data**: What data will you need? Which are already available in digital form? How will you obtain and incorporate into your *Model* any necessary data that are not already in digital form? How will your data be structured--as map or any other digital form?
5. **Methods**: What procedures will you use to do the analysis? Be specific. What are the strengths of these methods?
6. **Result and Discussion**: What is the result of your work what future work would you recommend? Explain your findings in line with the literature you reviewed and the problem (gap) you identified under item 2 above.
7. **Applications**: How might your research results be used to improve existing problem?
8. **Conclusion**: prepare a brief conclusion of your study and its future relevance in highway engineering applications.

**Questions to answer in your write-up**

* Why did you choose this topic?
* What specific questions do you hope to answer via your final project?
* What information do you need to answer your questions? Be specific.
* Where are you going to get this information?
* How are you going to acquire this information and get it into your model? (i.e., in what format does the data come in? Are you going to have to edit or convert this information in any way?)
* Once you have the information, what criteria are you going to use to find out what you want to know?
* What steps or data manipulation will you have to do to accomplish this goal?
* What information or message do you want to communicate to others with your final project?
* What will the final project look like?

**Deliverables**

* Submission Data: Monday, 16th July /2018
* Where to submit via fishbehulu@gmail.com or CD
* What to submit?
* Soft copy of the design report / Research finding (50 page maximum)
* Entire folder with WaterCAD / EPANET/WaterGEMs/GIS
* Any background map (ArcGIS, Google Earth, and Contours etc.)
* Key requirement in your model results:
* Please, make a review of appropriate journals as much as you can.
* Population and demand forecast analysis result (MsWord and MsExcel)
* Skeleton of your model
* Reservoir (s)
* Pressure zones
* Pumping arrangement if needed in your design (analysis in the report or separate design drawing in AutoCAD)
* System capacity determination (hydraulic design)
* Treatment plant design (at least disinfection)
* Complete performance evaluation report (if your work is done based on existing water supply system of a town)