

## Report Writing Outline and Timeline (Sp 2020 only)

### 1. Title Page: (All reports)

- a. Title of the project
- b. Team membership
- c. Instructor/Advisor
- d. Course number (e.g., ME195A or ME195B)
- e. Department name, University name
- f. Date

### 2. Abstract (ME195B Final Report)

- a. What you have done (one sentence)
- b. Why you do it – state the significance/impact of your work (one or two sentences)
- c. How you do it – state what challenges you were facing and how did you solved the problems in which methods/technologies. State the unique part of your work (one paragraph)
- d. Major/important results – state the most significant results and findings.

Keep in mind that the purpose of the abstract is to give a reader a general idea of your work without reading through the entire report. Most students don't know how to write a proper abstract – they either talk about too much background, or didn't show any important results in the abstract.

### 3. Acknowledgement (ME195B Final Report)

- a. Sponsor(s)
- b. Professors, technicians, staff, other students, friends and relatives, etc.

### 4. Tables of Contents (ME195B Final Report)

### 5. Chapter 1 Introduction (ME195A Report# 1)

- a. Motivation of the project (or needs)  
e.g., market needs, community needs, new technology needs, automation needs, energy saving needs, environmental protection needs.
- b. Current status (literature review)
  - How other people solve this problem in the past or currently
  - Which technologies they used
  - What kinds of results they have achieved
  - What issues or disadvantages of their methodsPlease don't forget to put the reference/source when listing each work
- c. Project objectives and specifications
  - How would you tackle the problem differently from the existing methods
  - Which technologies or principles or methodologies you are proposing?
  - What specifications and results to be expected (e.g., including materials you choose, geometry, accuracy, speed, weight, capacity, constrains)
- d. Significance of your project and its uniqueness and challenges
- e. Team work
  - Indicate the responsibility of each team member on the project

- How does he/she conduct the task(s)/project.

It would be ideal to have a multi-disciplinary team (e.g., the first member is in design, the second member is in mechatronics, and the third one is in thermal and fluid area).

f. Gantt Chart

A *Gantt chart* is a type of bar chart, developed by Henry Gantt, to illustrates a project schedule from the start date to finish date. Terminal elements and summary elements comprise the work breakdown structure of the project.

**6. Chapter 2 Theoretical Background (ME195A Report# 2)**

- State the theoretical background and engineering principles behind the project

**7. Chapter 3 Senior Project Design (ME195A Report# 2-3)**

- Illustrate how many design concepts and options the team had come up at the early stage of ME 195A, and how the team selected the most optimal solution through:
  - Analysis of pros and cons of all the available options, and/or
  - preliminary experiments (if any), and/or
  - computer simulation and/or FEA, and/or
  - theoretical calculation
- Compare and show the results that support the selection of the optimal solution in (a)
- Show your finalized design

**8. Chapter 4 Microcontrollers and Electronic System Interface (if applicable) (ME195A Report# 2-3)**

- Show how you design or use the commercially available electronics circuit and programming to control your device
- Show the features of your microcontroller, electronic components, circuit
- Draw a block diagram to show how your electronic system functions
- Show how you interface your prototype to the electronic system, what data acquisition system (DAQ) you used and what kind of software you used for data analyses.

**9. Chapter 5 Fabrication and Assembly (DELETE this chapter from ME195B Report)**

- Show how you made the prototype
  - Fabricated parts
  - Purchased parts
  - What challenges on making parts
- Show the final assembly of your prototype

**10. Chapter 6 Simulation Results and Analyses (ME195B Report# 2-3)**

- Show the overall design arrangement

- b. Show your simulation outcomes under different operating conditions
- c. Analyze your data using computer (e.g., Fast Fourier Transformation, LabVIEW, Matlab, etc. if appropriate)
- d. Show the simulation results in figures and/or tables. Indicate what does each curve or plot means, how do they indicate the functions of your final design
- e. How do these results match your specification, as well as meet your design criteria.
- f. Indicate whether or not the final design meets the safety requirements.
- g. Estimate the cost (economic) effectiveness of your design and its benefits to society

#### **11. Chapter 7 Conclusions and Future Work (ME195B Final Report)**

- a. Draw conclusions from your design, analytical calculations, and simulations.
- b. Comment on whether or not they meet your specifications.
- c. Draw conclusions from your team work
- d. Draw conclusions from cost analyses
- e. State the future improvements.

#### **12. Reference (All Reports)**

- a. List all resources/references for your project work.

#### **13. Appendix (Add to your report as needed)**

- a. Show the detailed calculations here.
- b. Include the detailed simulation results and computer programming codes here
- c. Given the detailed design drawings, dimensions with GD&T, and materials features
- d. Attach all datasheets of your intended-to-be-ordered components here (if applicable)