

Goals in MAE 112 Propulsion

- In less than a year, most of you will be professionals, working as engineers.
- Likely, you will be engaged in projects where errors could cost lots of money and might create unsafe or unhealthy situations.
- You might be asked to do things differently from standard approaches. That is, innovation is likely to be desirable.
- The conclusion is that you should understand why things are done the way they are done, not just how they are done. This will better prepare you for innovation and keep you away from costly errors.

The Role of Theory

- Some students ask for more emphasis on step-by-step solution of sample problems and less emphasis on theory development.
- We do provide guidance on solution steps through the discussions and the office hours.
- Emphasis is placed on the theory (i.e., scientific foundations, critical assumptions, and limitations on methodologies) in the lectures because that is necessary to prepare you for an innovative career with the proper level of professional competence. You must come to know when and why the steps in the solution must be changed.
- The mathematics in this course should not be the most challenging that you have experienced. We present simplified configurations: e.g., one-dimensional flow, perfect gas, simplified consideration of losses due to friction and heat transfer. However, the breadth of applied science is likely the greatest that you have seen in one course: mechanics, thermodynamics, chemistry, fluid dynamics, electromagnetic theory, plus touches of nuclear theory and solar radiation. So, there is a challenge here.
- Understand that, without comprehension of the underlying theory, you will not be well set to expand your capabilities as new situations are encountered. Methods and applications will change for you in the future while theory will be more stable.