

Design Memo Reports (Continued)

By the end of this class you should be able to:

- describe the nature & logic Engineering Department's standard for memo reports
- prepare a memo on your design using the Department's standards

Memo Organization

Some Keys

- Start with Context:
- What? - So What?
- Give the "bottom line" early
- Use subheadings (divisions)
- Draft & Revise

Structures

1. Problem - Solution
2. Main Idea - Significance
3. Compare - Contrast
4. Objective - Scope - Division
5. Summary - Division - Wrap
6. Listing

The memo report format discussed here is specifically for technical/design project reporting

Structure & the First Page

- Four pieces (generally not titles):
Purpose Summary Discussion (division) Wrap

- The first page is critical
 - Why
 - How
 - Result/action
- Write this page last
- Use the room you have

By the end of the first page the reader should know what they will do:

- read further
- act on the recommendations
- pass on to another
- file (including file 13)

After the first page

- Division - many possible arrangements, e.g.
 - (Additional) Background
 - Theory
 - Method
 - Results'
 - Alternatives
- Wrap → Conclusions & Recommendations
 - What do you think should be done (you are the engineer)?
→ be specific, ready to implement
 - key conclusions & recommendations were also on the first page.

Format (see second handout)

Text:

- Plain, readable font (12 point)
- Use subtitles
- Consistent format
(usually: single spaced, double between paragraphs, one inch margins.)

Numbers:

0.123 kJ/(kg K)

Leading zero before decimal point

use true superscripts for powers

Space between number and units

Format: Figures

Consider whether figures will copy

Explicitly discuss all figures in text

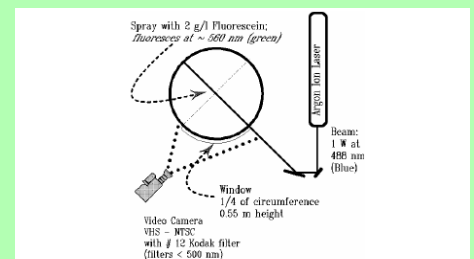


Figure 1: This diagram shows the top view of the laser-induced-fluorescence flow-visualization setup. The laser beam is expanded in the vertical direction by two cylindrical lenses.

A figure title goes below the figure including:
"Figure"
A sequential number
A descriptive caption

Format: Tables

Purpose: Summarize large quantities of data (→ use attachment)
 Display limited or complex data
 Exact comparison required

Explicitly discuss all tables in text

A table title goes above the figure including:
“Table”
A sequential number
A descriptive caption

Table 1: Effective Length and average values of \bar{h} for each of the fins.

F_{in}	$L_{eff} (m)$	$\dot{Q}_{base} (W)$	$\bar{h} (W / m^2 K)$		
			Experimental		Numerical
			Eq. (25)	Eq. (30)	Eq. (31)
1	0.39	0.90	15.0	12.5	15.2
2	0.57	2.38	12.6	10.2	12.2
3	0.75	3.77	11.4	8.9	10.7

Choose number of digits carefully

Do not split table with a page break

Format: Equations

Use an equation editor

Number equations & refer to them by number

$$f_1 = \frac{(kL)_1^2}{2\pi L^2} \sqrt{\frac{EI}{\rho A}} \quad (1)$$

where:

$(kL)_1 = 4.73$ (dimensionless)
 L = length of the rod
 E = Young's Modulus (Modulus of Elasticity)
 ρ = density of the material
 A = cross sectional area
 I = area moment of inertia

Define all variables at first use.

Explicitly discuss all equations in text

Routes from Downtown to IPFW: Results Focus vs. History Focus

History Focus

- The first time I drove I went north on Sherman to Coliseum ...
- Next I drove up Lafayette ...
- One route that did not work out is ...
- Recently I found that going Main to Parnell ...

Results Focus

- Method: Five routes were compared by driving them four times each and measuring the time from City hall to IPFW
- Results: Routes 2 & 3 were found to be the

Avoid History!

Relationship to Reports in *Engineering by Design*

Cover letters

- like first page of memo
 - Purpose
 - Method
 - Results → So What?
 - One page

Technical reports

- Organizational material
- Intro
- Background
- Methodology
- Alternative solutions
- Final design solution
- Conclusions
- Recommendations
- Biblio.
- Appendices

Memo on your Development of “Flight Conditions”

- Use first page for purpose and summary
- Clear definition of goal
- Clear recommendation/conclusion that is ready to implement
- Background – if not covered on first page
- Alternatives – other good conditions (a couple)
- Main choice – why it is the best (relate to goal)
- Methodology – how did you get there (but not history)

Due: Wednesday at the beginning of class (must have)