Preface: Bridging the writing transfer gap

Although all engineering students learned how to write, they may struggle with transferring that knowledge to writing engineering laboratory reports. These modules are meant to be very concise, simple, and easy to use aids for helping engineering students improve their engineering laboratory report writing skills.

Enclosed are one-page modules, each to help students develop one aspect of writing a lab report. The modules are scaffolded – that is, they are structured such that those with little experience writing technical documents may choose to start at a *fundamental* level and those with more experience may start at an *intermediate* or *advanced* level. See Table 1. The modules are independent, not sequential, so you may use fundamental modules in one topic, and advanced modules in other topics. The modules include:

- One or two page description to help instructors
- links to details on the subject to help students achieve specific outcomes
- links to rubrics to help students identify what they should focus on and to help instructors with grading and assessing.

Purpose of writing: Engineers write for two reasons: to help them learn and to communicate. The modules assume students are also writing for two reasons: to practice and improve this important communication skill and for the sake of meaning-making (the writing process helps you gain technical knowledge on the subject)

Table 1 – module descriptions.

Scaffold Level	Module	Faculty writing instruction guide	Student workbook
Fundamental	F1-Lab report as a genre (audience-writer-purpose) F2-Lab report organization F3-Lab report conventions F4-Data analysis I (univariate data: average, variation) F5-Data presentation (graphs, tables, photographs)	Slides; Example assignments/ approaches; How to use/modify the student workbook contents; and References in writing pedagogies.	Learning objective; Instructional content; Exercises; Quizzes; Annotated lab report samples; and Common mistakes by students.
Intermediate	I1-Claims using primary and secondary sources I2-Summary and conclusion writing I3-Data analysis II (bivariate data: curve fitting, correlation, etc.) I4-Referencing in engineering reports		
Advanced	A1-Logical appeals A2-Data analysis III – (error analysis) A3-Data analysis IV (propagation of error) A4-presenting uncertainty/statistical data sets.		

Glossary

Lab report: a document that discusses and interprets data resulting from laboratory work. They typically range from one page to several hundred pages depending upon the amount of work being discussed and the depth of details needed. Regardless of length, lab reports contain an *Introduction*, *Body* (which includes *Methods*, *Results* and *Discussion*), and *Conclusion*. They may contain other elements as well. The acronym IMRDC (I'M RaD C) may be used (Introduction, Methods, Results, Discussion, Conclusion).

Rhetoric: the art of persuasive writing. "Persuasion" does not imply "exaggeration" or "bias".

Persuasive writing: writing to convince an audience that your opinion is correct. For engineering lab reports, your opinion must not be based upon a "feeling", "hunch" or "guess" – it must be based upon your professional interpretation of the data you are reporting. It must be unbiased. You are not trying to persuade someone to buy a commercial product, or to vote for a certain candidate, you are trying to convince them that you have appropriately collected and interpreted the data and therefore, your conclusions are correct.

Genre: a type of writing style with a specific purpose. Engineering lab reports are one type of writing genre with specific conventions that may differ from other writing genre (such as an English literature composition).

Meaning-making – a phrase used to indicate that the writing process itself can help you learn about what you are writing.

Data: plural of datum. Refers to measured quantities or qualitative characteristics obtained through laboratory work.

Univariate data: data pertaining to one variable. Example: the weight of truck.

Bivariate data: data pertaining to two, typically related, variables. Example: temperature in the room and time of day (*temperature* and *time* are the two variables)

Concise – Concise means to communicate important information with as short of a description as possible. It is not simply a matter of reducing word-count – important information must be communicated.