

## Guidelines for Report Writing

Reports (seminar reports, thesis reports, technical reports) are very important documents and must be taken seriously. A report is a means of conveying to the reader many important things: (a) the current status of the topic (literature survey), (b) the problems still to be solved or addressed, (c) the progress that you have made toward the goal of solving these problems, (d) issues that still need to be worked on. A good report, along with the references cited, should make a reasonably complete document by itself.

There are different *styles* of writing a report. Some people tend to be very formal and precise; others like to be somewhat informal and verbose. Style also depends to some extent on the topic. One cannot get too informal when writing a proof. On the other hand, an informal style may be effective, for example, in describing the historical background of a given topic.

While style is an important aspect of a report, there are the “nuts and bolts” to be taken care of, too. The guidelines presented here are about the latter. Do follow these tips to make your report free of the most common mistakes.

1. Choose a font size that is not too small or too large; 11 or 12 is a good font size to use.
2. Acknowledgment need not be a separate page, except in the final report. In fact, you could just drop it altogether for the first- and second-stage reports. Your guide already knows how much you appreciate his/her support. Express your gratitude by working harder instead of writing a flowery acknowledgment!
3. Make sure your paragraphs have some indentation and that it is not too large. Refer to some text books or journal papers if you are not sure.
4. If figures, equations, or trends are taken from some reference, the reference *must be* cited right there, even if you have cited it earlier.
5. The correct way of referring to a figure is Fig. 4 or Fig. 1.2 (note that there is a space after Fig.). The same applies to Section, Equation, etc. (e.g., Sec. 2, Eq. 3.1).
6. Cite a reference as, for example, “The threshold voltage is a strong function of the implant dose [1].” Note that there must be a space before the bracket.
7. Follow some standard format while writing references. For example, you could look up any IEEE transactions issue and check out the format for journal papers, books, conference papers, etc.
8. Do not type references (for that matter, any titles or captions) entirely in capital letters. About the only capital letters required are (i) the first letter of a name, (ii) acronyms, (iii) the first letter of the title of an article (iv) the first letter of a sentence.
9. The order of references is very important. In the list of your references, the first reference must be the one which is cited before any other reference, and so on. Also, every reference in the list must be cited at least once (this also applies to figures). In handling references and figure numbers, Latex turns out to be far better than Word.

10. Many students use Gnuplot for preparing their figures. By default, this program draws the line type and writes the file name and things like “u 1:2” etc. which makes absolutely no sense to the reader. You need to remove these or change them to some meaningful labels. In fact, even manually labeling the different curves with arrows may work well, if you do it neatly. Remember to do this *before* you make copies.
11. Gnuplot, by default, uses narrow lines. These lines often do not show up well in the figures, especially in photocopies. Use a larger line thickness parameter to make things more clear. For example, use  
`plot “xyz.dat” u 1:2 lw 2`  
Also, dotted lines generally are harder to see clearly; use solid, dashed, dash-dot, etc.
12. In figures, do not use “complete filling.” All drawing programs generally offer several other filling options such as dots, shading, etc. They may not only look better, but also save ink when printing or copying.
13. Many commercial packages allow “screen dump” of figures. While this is useful in preparing reports, it is often very wasteful (in terms of toner or ink) since the background is black. Please see if you can invert the image or use a plotting program with the raw data such that the background is white.  
  
The following tips may be useful: (a) For Windows, open the file in Paint and select Image/Invert Colors. (b) For Linux, open the file in Image Magick (this can be done by typing `display&`) and then selecting Enhance/Negate.
14. As far as possible, place each figure close to the part of the text where it is referred to.
15. A list of figures is not required except for the final project report. It generally does not do more than wasting paper.
16. The figures, when viewed together with the caption, must be, as far as possible, self-explanatory. There are times when one must say, “see text for details”. However, this is an exception and not a rule.
17. The purpose of a figure caption is simply to state what is being presented in the figure. It is not the right place for making comments or comparisons; that should appear only in the text.
18. Axes in figures must carry appropriate units. If that is not done, at least the caption must say, “current is in mA,” etc.
19. If you are showing comparison of two (or more) quantities, use the same notation throughout the report. For example, suppose you want to compare measured data with analytical model in four different figures. In each figure, make sure that the measured data is represented by the same line type or symbol. The same should be followed for the analytical model. This makes it easier for the reader to focus on the important aspects of the report rather than getting lost in lines and symbols.

20. If you must resize a plot or a figure, make sure that you do it simultaneously in both  $x$  and  $y$  directions. Otherwise, circles in the original figure will appear as ellipses, letters will appear too fat or too narrow, and other similar calamities will occur.
21. In the beginning of any chapter, you need to add a brief introduction and then start sections. The same is true about sections and subsections. If you have sections that are too small, it only means that there is not enough material to make a separate section. In that case, do not make a separate section! Include the same material in the main section or elsewhere.  
  
Remember, a short report is perfectly acceptable if you have put in the effort and covered all important aspects of your work. Adding unnecessary sections and subsections will create the impression that you are only covering up the lack of effort.
22. Do not make one-line paragraphs.
23. Always add a space after a full stop, comma, colon, etc. Also, leave a space before opening a bracket. If the sentence ends with a closing bracket, add the full stop (or comma or semicolon, etc) *after* the bracket.
24. Do *not* add a space before a full stop, comma, colon, etc.
25. Using a hyphen can be tricky. If two (or more) words form a single *adjective*, a hyphen is required; otherwise, it should not be used. For example, (a) A short-channel device shows a finite output conductance. (b) This is a good example of mixed-signal simulation. (c) Several devices with short channels were studied.
26. If you are using Latex, do not use the quotation marks to open. If you do that, you get "this". Use the single opening quotes (twice) to get "this".
27. Do not use very informal language. Instead of "This theory should be taken with a pinch of salt," you might say, "This theory is not convincing," or "It needs more work to show that this theory applies in all cases."
28. Units: we tend to write the abbreviated form for most of the units, e.g.,  $A$ ,  $V$ . As a general rule, if the unit is an abbreviation of a person's name, write it in italics and capital. On the other hand, a meter is abbreviated and written as  $m$  (i.e., roman character and small). If you abbreviate "milli" or "kilo", the abbreviation is roman, not italic, e.g.,  $10\text{ k}\Omega$  and not  $10\text{ k}\Omega$ . Always leave a space between the number and the unit.
29. Do not refer to the Fermi level as "fermi level", as Fermi is a person's name.
30. Do not write  $1 \times 10^{18}$  as  $1e18$ . Do not write  $p = q r$  as  $p = q \star r$ .
31. The correct way to describe the base doping density of a BJT would be  $1.5 \times 10^{17}\text{ cm}^{-3}$  and not  $1.5 \times 10^{17}\text{cm}^{-3}$  or  $1.5e17\text{cm}^{-3}$ .
32. Do not start using an acronym before defining it unless it is very widely used (e.g., MOSFET or VLSI).

33. Element symbols must be in roman, e.g., SiO<sub>2</sub>, and not *SiO*<sub>2</sub>; Ga<sub>x</sub>Al<sub>1-x</sub>As, and not *Ga<sub>x</sub>Al<sub>1-x</sub>As*.
34. Do not use “&”; write “and” instead. Do not write “There’re” for “There are” etc.
35. If you are describing several items of the same type (e.g., short-channel effects in a MOS transistor), use the “list” option; it enhances the clarity of your report.
36. Do not use “bullets” in your report. They are acceptable in a presentation, but not in a formal report. You may use numerals or letters instead.
37. Whenever in doubt, look up a text book or a journal paper to verify whether your grammar and punctuation are correct.
38. Do a spell check before you print out your document. It always helps.
39. Always write the report so that the reader can easily make out what *your* contribution is. Do not leave the reader guessing in this respect.
40. Above all, *be clear*. Your report must have a *flow*, i.e., the reader must be able to appreciate continuity in the report. After the first reading, the reader should be able to understand (a) the overall theme and (b) what is new (if it is a project report).
41. Plagiarism is a very serious offense. You simply cannot copy material from an existing report or paper and put it verbatim in your report. The idea of writing a report is to convey *in your words* what you have understood from the literature.

The above list may seem a little intimidating. However, if you make a sincere effort, most of the points are easy to remember and practise. A supplementary exercise that will help you immensely is that of looking for all major and minor details when you read an article from a newspaper or a magazine, such as grammar, punctuation, organization of the material, etc. Wish you happy report writing!