

Technical Literature

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Embarking on a technical project will require an engagement with *technical literature*. Professionally, you will often need to demonstrate that you have consulted appropriate sources of information and this applies as equally in a commercial setting as it does in an academic environment. Your own project may be a design, test and build project, or it may be a research oriented investigation. In both cases, technical literature is still an important part of producing work with high-quality technical depth.

What exactly is 'Good Quality' Technical Literature?

The literature you use to support and inform your project needs to be:

- of academic standard
- relevant
- fit for purpose
- current

The project work you doing should reflect the academic level to which you aspire to be qualified! Practically, this means that the literature you consult should deal with technical details at an *appropriate level*. There is a huge amount of technical literature aimed at educating the enthusiastic novice in a particular subject. Whilst such literature may sometimes be useful, it must be remembered that your project work is not intended to be at novice level.

Frequently, literature is consulted (and referenced) which has only a scant relevance to the real subject matter at hand. Occasionally, this is justified on the basis that it may be used to put the work in context or to explain the background motives for the work. Caution must be exercised to avoid reading too much literature which is diverse and largely irrelevant to the topic.

'Fit for purpose' means that the literature you consult must be technically correct! Again, this seems obvious, but it is your responsibility to discern the quality of literature, and recognise material of

dubious technical quality. There are steps you can take (see below) to reduce the risk of using incorrect material.

One of the difficulties of working in a discipline where change and progress are rapid is that you may use literature which, whilst not incorrect, is not sufficiently up-to-date. Always consider the date of publication when seeking to establish the 'state-of-the-art'.

However, this does not mean that older literature is useless! You should not be put off consulting and referencing older literature, *just because* it was published a long time ago! Books are generally older and better established as references in a particular field. They should always be included in your survey of literature as they usually provide a good overall background to the topic.

Important: Good references have clearly identifiable authors (even if these are corporate bodies). Avoid using anything which appears to be anonymous. Certainly, you should never reference anything which has no clear authorship. This is just one reason (and there are others!) why *Wikipedia* should not be cited as a reference.

Search Strategies for Technical Literature

You may be wondering, in the 21st century, why this question needs to be asked at all. We have 'Google' and that should cover everything, shouldn't it? You may be surprised to learn that, in fact, Google does not cover everything! And even good quality literature that is found through Google may be better accessed via another means.

Academic journals *can* be found through Google, but you may be asked to pay for accessing them. The same journals are often free to access for members of the University, but only when accessed through the correct 'gateway'.

Google searches retrieve thousands of results, many of which are not of sufficiently high quality. You must then spend considerable time sifting through them. An often ignored fact is that there is no quality control for internet publishing. 'Wiki' documents and bulletin boards/forums may be useful, but there is no guarantee that you will not be misled by inaccurate information. Less relevant in engineering than some disciplines, but still occasionally an issue, is a lack of *objectivity*. The Internet is often used by individuals to publish opinions which are heavily biased. Use such articles with caution!

Thought: Google is useful; no-one would suggest otherwise. But think outside the Google box!

When you do use Google, use it smartly. Time is often wasted trawling through search results which could be reached much faster by using Boolean operators in your search criteria.

A Boolean AND search is the default in Google. But you can use OR (put '|' between your keywords) and NOT (put '-' before the term you want to exclude). For example, the results from a Google search on 'Cambridge' will normally be dominated by references to Cambridge University. You can exclude all the University related results by searching for 'Cambridge -university'. Try it.

You can also force a phrase to be searched for *verbatim* by using quotation marks (e.g. "a search phrase to look for exactly") and you can also switch off Google's automatic synonyms by placing '+' before words (for example, to search for 'electronic' but *not* 'electronics', use '+electronic').

Electronic Libraries

These are library facilities which are not located on campus. Using them will broaden your search results, and some offer 'e-books' which can be read on-line. Generally, these libraries are of good quality:

- Knovel Library
- Referex
- EngNetBase
- The National Academies Press

University Library Resources

The University Library has a number of databases for literature searching. These contain information about books and articles which is not available through Google.

Using the recommended 'Gateways' for retrieving digitally formatted, high-quality literature will produce filtered results. Thus, you may get fewer search results returned, but they will generally be of higher quality.

The University Library has 'Subject Pages' which can be accessed via the portal. Here you will find advice on how to access IEEE Explore and INSPEC (engineering in general) which are databases of conference proceedings, journals, magazines, published standards, etc, relevant to electronic and electrical engineering.

IEEE Explore covers publications from the IEEE (US based, but global in scope, 'Institute of Electrical and Electronics Engineers') and the UK's IET (Institute of Engineering and Technology).

Interpreting Technical Literature

Once you have found appropriate literature, it is necessary to interpret it effectively. This may seem obvious, but a lot of time can be wasted ploughing through literature that is only partially relevant or which is so difficult to interpret that it seems of little use.

Manufacturers' data sheets require sifting in order to identify relevant information. And often, you may find useful information is present, but obscured by unfamiliar formatting. Look carefully at graphs, for example, to find out exactly what is being presented to you.

With academic journals and papers, you may be daunted by the technical depth of the information before you. This is not a reason to avoid academic journals! For one thing, you don't have to understand absolutely every detail in a technical paper in order to get something useful from it.

Thought: Sometimes it is quite acceptable to extract some useful information from literature, or at least obtain an overview, and accept that you don't have time to understand *everything* fully.