



Technical Writing for Papers and Reports

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Technical Writing Services for the College of Engineering

What I Do

- Edit conference papers, journal papers, and reports for faculty
- Edit proposals for faculty
- Present the Technical Writing workshop series
- Other projects for the Dean's Office

Technical Writing Services

1. Steps in writing a technical paper or report
2. Grammar and punctuation basics

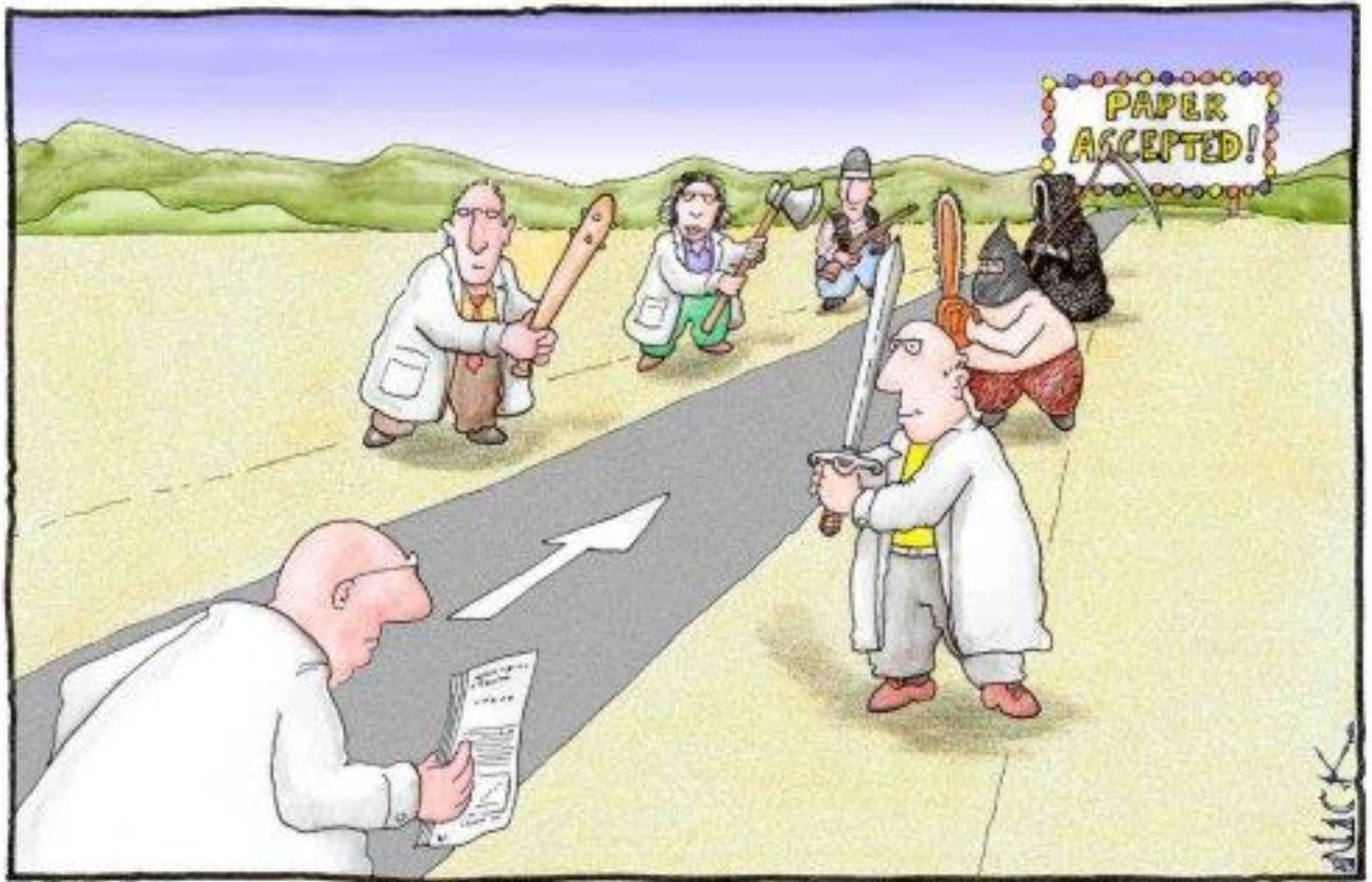
Most engineers assume that one form of technical writing will be sufficient for all types of documents.

This is absolutely not true.

This presentation will help you sharpen your technical writing skills so that you have a greater chance of your papers getting accepted and your proposals succeeding.

What this workshop is about

1. Steps in Writing a Technical Paper or Report



Most scientists regarded the new streamlined peer-review process as 'quite an improvement.'

Image Source Page: http://cirtl.wceruw.org/Forum2003/Presentations/trower_files/TextOnly/Slide5.html

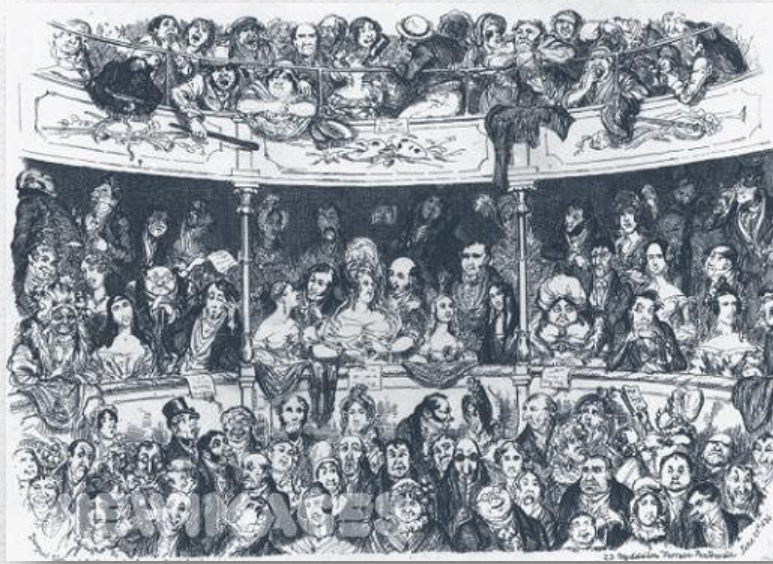
Steps in writing a technical paper or report

1. Know your audience
2. Organize your thoughts
3. Follow the journal's style guide
4. Pay close attention to copyright and ethics issues
5. Refine your work
6. Converting your thesis or dissertation into a paper
7. Things to think about when writing a report
8. Knowing when to stop writing



Image Source Page: <http://www.historiann.com/wp-content/uploads/2010/05/audience.jpg>

Know your audience



- Knowing your audience is critical to writing a good technical document – or any written material, for that matter.
- If people think you do not understand who they are and what they are interested in, then:
- They simply won't read your work.

Know your audience

The Writing Process

- Peers in your specific field?
- Peers in your general field?
- Technical people not in your field?
- A non-engineering but professional audience?

**Decide who is your
primary audience.**

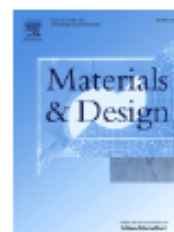
**Understand who are your
secondary audiences.**

Know your audience



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DESCRIPTION

Today's products and their constituent components and structures have to meet increasingly stringent requirements during operation. The economic and human costs of failure during service impose a great responsibility on organisations and individuals who develop new materials and those who select and integrate materials in a final engineering design. A critical feature of successful product development is the judicious selection of the best material or materials, based on an informed awareness of the capabilities and opportunities afforded by all candidate materials, coupled with a design that takes full advantage of those capabilities.

The aim of *Materials & Design* is to promote a greater knowledge and understanding of the attributes and capabilities of all types of modern engineering materials in the context of **engineering design**.

Materials & Design publishes a range of high quality peer reviewed research articles including full papers, short communications and technical reports, and occasional special issues, that investigate the **properties** of materials that influence or control any practical design. All types of **engineering material** are addressed including metals, ceramics and glasses, polymers and elastomers, and composites, and all scales of **design application** from micro-machinery to large structural components. The content is broad and relevant to materials researchers, engineers and designers in academia and in industry.

The technical level is postgraduate but not specialist, with an emphasis on developing practice rather than theory, for the field of **materials engineering** in preference to science, making appropriate links to processing. To reflect the multidisciplinary nature of design, submissions to *Materials & Design* should also be understandable and offer information useful to professionals working in fields outside but related to the immediate subject of the article.

AUDIENCE

Design engineers, consulting engineers, project managers, materials researchers, and technical managers.

IMPACT FACTOR

2012: 2.913 © Thomson Reuters Journal Citation Reports 2013



Journal of Hydrology

The Journal of Hydrology publishes original research papers and comprehensive reviews in all the subfields of the **hydrological sciences** including **water based management and policy** issues that impact on economics and society. These comprise, but are not limited to the physical, chemical, biogeochemical, stochastic and systems aspects of surface and groundwater **hydrology**, **hydrometeorology** and **hydrogeology**. Relevant topics incorporating the insights and methodologies of disciplines such as climatology, water resource systems, hydraulics, agrohydrology, geomorphology, soil science, instrumentation and remote sensing, civil and environmental engineering are included. Social science perspectives on hydrological problems such as resource and ecological economics, environmental sociology, psychology and behavioural science, management and policy analysis are also invited. Multi- and interdisciplinary analyses of hydrological problems are within scope.

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Sometimes, the journal you plan to submit your paper offers hints as to your audience.

1. Know your audience 
2. Organize your thoughts
3. Follow the journal's style guide
4. Pay close attention to copyright and ethics issues
5. Refine your work
6. Converting your thesis or dissertation into a paper
7. Knowing when to stop writing and refining your work

1. Steps in writing a technical paper

Organize your thoughts

Standard Outline for a Technical Paper

Abstract

Introduction

Background or
Literature Review

Methods and
Materials

Data and Results

Discussion

Conclusion

Acknowledgements

References

Standard Outline for a Technical Paper

Abstract

- The problem
- How the study addresses this problem
- Key results

Introduction

Write this last

Background or Literature Review

The most difficult part of the paper to write

Methods and Materials

Straightforward

Data and Results

Straightforward

Discussion

Your ideas on what the data means

Conclusion

- Summary of the findings
- Limitations of the study
- Recommendations

Acknowledgements

Especially grant sources

References

Pay special attention to the journal guidelines for references

Organize your thoughts

Use the resources of this university to help you with this step.

- Writing Center
<http://writingcenter.unlv.edu/>
- Online Writing Lab
<http://writingcenter.unlv.edu/owl/>
- Downloadable Writing Tips
<http://writingcenter.unlv.edu/writing/downloads.html>
- Purdue OWL
<http://owl.english.purdue.edu/owl/resource/544/01/>
- Upcoming workshop in How to Search and Write a Literature Review
 - Presenters: Julie Longo & Sue Wainscott)

Organize your thoughts



Image source: <http://masonenglish101.files.wordpress.com/2013/08/cartoon-writer.jpg>

Actually, yes.

Organize your thoughts

1. Know your audience 
2. Organize your thoughts 
3. Follow the journal's style guide
4. Pay close attention to copyright and ethics issues
5. Refine your work
6. Converting your thesis or dissertation into a paper
7. Knowing when to stop writing and refining your work

1. Steps in writing a technical paper

Follow the journal's style guide

You **must** check the style guidelines of the journal or conference paper.

- This is the first thing that the editors of the journal or conference will check – and **reject** if you don't comply.
- Suggested strategy:
 - Find out and understand the style of that journal or proceedings.
 - Write your paper freely; don't be overly concerned about the style at this point.
 - Once you have written and edited your paper, then format it according to style guidelines.

Every journal and conference has some kind of style guide they want you to follow.

The style guide includes:

- Font type and size
- Double space, single space, etc.
- The way headers should look
- Indent or spaced paragraphs
- Abstract word count
- Keywords? Highlights?
- Page length of paper
- How to submit artwork and tables

Read the style guide for that publication
very, very carefully.

Follow the journal's style guide

Sample style guides

IEEE Author Digital Toolbox

http://www.ieee.org/publications_standards/publications/authors/authors_journals.html

Elsevier journals: extensive author instructions

<http://www.elsevier.com/authors/home> and search for Guide for Authors for the journal you are interested in.

Springer's Author Academy

<http://www.springer.com/authors/author+academy?SGWID=0-1739713-0-0-0>

ASCE Guide for Authors

<http://www.asce.org/Content.aspx?id=18107>

Follow the journal's style guide



Browse journals > Journal of Hydrology > Guide for authors

Guide for Authors



Author information pack

BEFORE YOU BEGIN

- Ethics in publishing
- Conflict of interest
- Submission declaration and verification
- Contributors
- Changes to authorship
- Copyright
- Role of the funding source
- Funding body agreements and policies
- Open access
- Language and language services
- Submission
- Submission: Special Issues

Referees

- Additional information

PREPARATION

- Use of wordprocessing software
- Article structure
- Essential title page information
- Abstract
- Graphical abstract
- Highlights
- Keywords
- Abbreviations
- Acknowledgements
- Artwork

Tables

- References
- Video data
- AudioSlides
- Supplementary data
- Data at PANGAEA
- Submission checklist

AFTER ACCEPTANCE

- Use of the Digital Object Identifier
- Online proof correction
- Offprints
- Author's Discount

AUTHOR INQUIRIES

Guide for authors

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Author Academy: Now Featuring Interactive Courses!



Welcome to the Expanded Springer Author Academy, a guide from Springer and Edanz on writing and publishing.

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- » How to publish a journal article
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Videos with Chinese, Japanese or English subtitles

For those of you who prefer to listen to an instructor instead of reading we also provide videos (with Chinese and Japanese or English subtitles if you prefer).

Why is Publishing Your Work Important At All?

Before you begin, it may be useful to remind yourself of why publishing your work is important. You might need to publish in order to graduate, get a job, or advance your career. But first take a moment to think about two of the most important aims of scientists:

- » To add to the **body of human knowledge**
- » To help yourself and others **understand the nature of the universe**

You can't accomplish these goals without publishing! After all, the main way that others learn

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- 3,500 for notes
- 2,000 for discussions

The journal editor may waive these guidelines to encourage papers on topics that cannot be treated within these limitations. Such topics may include state-of-the-art reviews and detailed case histories. However, authors are advised that most topics can be covered within these limitations, and that clear justification is required for longer manuscripts.

Estimating Manuscript Length

Please use the [ASCE Sizing Worksheet](#) to estimate the words and word-equivalents of your submission. To use the Sizing Guide, count the number of words (except for tables and figures) on a typical manuscript page and multiply that by the number of total pages. Add word-equivalents for figures and tables by estimating the portion of the journal page each will occupy when reduced to fit on a journal page. A page in ASCE's journals holds approximately 1,260 words; therefore, a figure that would fill one quarter of a journal page would be 315 word-equivalents and a table that would fill one half of a journal page would be 630 word-equivalents.

ASCE journals

ASCE Journals Sizing Worksheet

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May 10, 2013

This worksheet will automatically calculate the total number of printed pages your article will occupy in the journal.

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Information on the maximum allowed length for each article type can be found online at:
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Number of pages in your manuscript:

Number of figure pages:

Number of table pages:

Estimated article pages:

- Please include figure captions when indicating the size of your manuscript.

- Manuscripts should use 12 pt. font, double spaced, with 1 inch margins.

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♦ Preparing your article

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(PDF, 132 KB)

A manual outlining editorial guidelines for IEEE Transactions, Journals, and Letters.

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(PDF, 728 KB)

A catalog of IEEE's titles, including historic publications, along with their official reference abbreviations, and acronyms.

› [Keywords Suggested for Authors](#)
(PDF, 326 KB)

Authors are encouraged to select keywords from this list. It comprises the first three hierarchical "levels" under each term-family (or branch) that is formed from the top-most terms of the IEEE Thesaurus. If you cannot find appropriate terms, you may add your own.

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♦ Templates for Transactions

Template should be used for all Transactions, except for the *IEEE Transactions on Magnetics*, *IEEE Magnetics Letters*, *IEEE Photonics Journal*, and *IEEE Transactions on Dielectrics and Electrical Insulation*.

Updated

- › [Template and Instructions on How to Create Your Paper](#) (DOC, 506 KB)
- › [Instructions Only](#) (PDF, 606 KB)
- › [WIN and MAC Bibliography File](#) (ZIP, 351 KB)
- › [Unix LaTeX2e Transactions Style File](#) (TAR, 1 MB)
- › [WIN OR MAC LaTeX2e Transactions Style File](#) (ZIP, 668 KB)

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♦ Template for IEEE Journal of Translational Engineering in Health and Medicine

- › [Template and Instructions](#) (DOC, 131 KB)
- › [JTEHM Challenge Papers Template](#) (DOC, 117 KB)

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IEEE Journals

Especially when creating reports
(NDOT reports, for example):

Create your own 'style sheet'

- As you begin to write, keep track of terms you use so that you are consistent.
- Note when you first use an acronym.
- If the journal or proceedings does not have instructions for headers, captions, or tables, create in your style sheet the format you plan to use.
- A customized style sheet is especially valuable for creating **reports to agencies** – you can create a consistent and professional look to the documents you submit.

Follow the journal's style guide

Citations and References

You must cite material correctly and provide references according to journal style guidelines

RefWorks

- All faculty, staff, students and alumni can access UNLV's RefWorks site for free.

<http://www.library.unlv.edu/research/refworks>

- Online tutorials and excellent help section
- Look for RefWorks workshops held by UNLV Librarians

Follow the journal's style guide

- **Ignore style guides at your peril**
- However -- don't let the style guide hamper your writing style



http://www.google.com/imgres?q=cartoon+%2B+%22editor%22&hl=en&tbo=d&biw=1440&bih=766&tbm=isch&tbnid=5VEDXXljC6mVxM:&imgrefurl=http://dianalutz.com/mail/mail.html&docid=ZD_JqBGg5U1YeM&imgurl=http://dianalutz.com/mail/editor400.jpg&w=456&h=400&ei=m0znUO3QJ8WkiQLA1oGABg&zoom=1&iact=hc&vpx=1153&vpy=117&dur=6845&hovh=210&hovw=240&tx=62&ty=237&sig=109333295108583453991&page=1&tbnh=134&tbnw=154&start=0&ndsp=32&ved=1t:429,r:7,s:0,i:122

1. Know your audience 
2. Organize your thoughts 
3. Follow the journal's style guide 
4. Pay close attention to copyright and ethics issues
5. Refine your work
6. Converting your thesis or dissertation into a paper
7. Knowing when to stop writing and refining your work

1. Steps in writing a technical paper

According to Springer's *Journal of Civil and Structural Health*:

Permissions

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ASCE respects the copyright ownership of other publishers and requires ASCE authors to obtain permission to reproduce any material that **they did not create themselves or has previously been published**. Each author has a responsibility to identify materials that require permission and to obtain permission from the copyright owner.

Authors publishing with ASCE (other than *Civil Engineering* magazine) are required to submit written documentation of the permission that they have received from the copyright owner.

Copyright and Permissions

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1. Steps in writing a technical paper

Refine Your Work

True for papers, reports, and proposals:

- After writing, put the document away for a couple of days.
- Print it out, and use a pen to mark your work up. The best way is to go through the paper several times for:
 - Flow of thought
 - In-text citations and references
 - Grammar and punctuation
 - Equations, figures, and tables
 - Conformance to the style guide

Specifically for Latex users

- The writing process has two phases:
 - Phase I
 - Original writing (raw)
 - Editing and refining
 - This phase is very fluid and changeable
 - Use some kind of format (MS Word, OpenOffice, text) that allows for easy revisions
 - Phase II
 - Formatting for publication
 - The material is finalized
 - The style is rigid
 - Do not put material into Latex until it is finalized, especially if you plan to work with a technical editor during Phase I

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1. Steps in writing a technical paper

Converting a thesis or dissertation into a paper

- In a thesis or dissertation, you have to include information that ensures your board of reviewers understand that you know your subject
- This information is extraneous and largely unnecessary for experienced readers of journals
- When converting a thesis to a paper, think carefully about who your new audience is, and edit accordingly.

1. Know your audience 
2. Organize your thoughts 
3. Follow the journal's style guide 
4. Pay close attention to copyright and ethics issues 
5. Refine your work 
6. Converting your thesis or dissertation into a paper 
7. Knowing when to stop

1. Steps in writing a technical paper

- An Editor-in-Chief once told me that it could take a lifetime to learn the art of knowing when to stop writing.
- There is a point in your writing – or editing – where you must stop or risk having your material degenerate.
- If there is too much information thrown into a paper – then, perhaps you need to write two or three separate papers...

Know when to



Errors common to engineers...

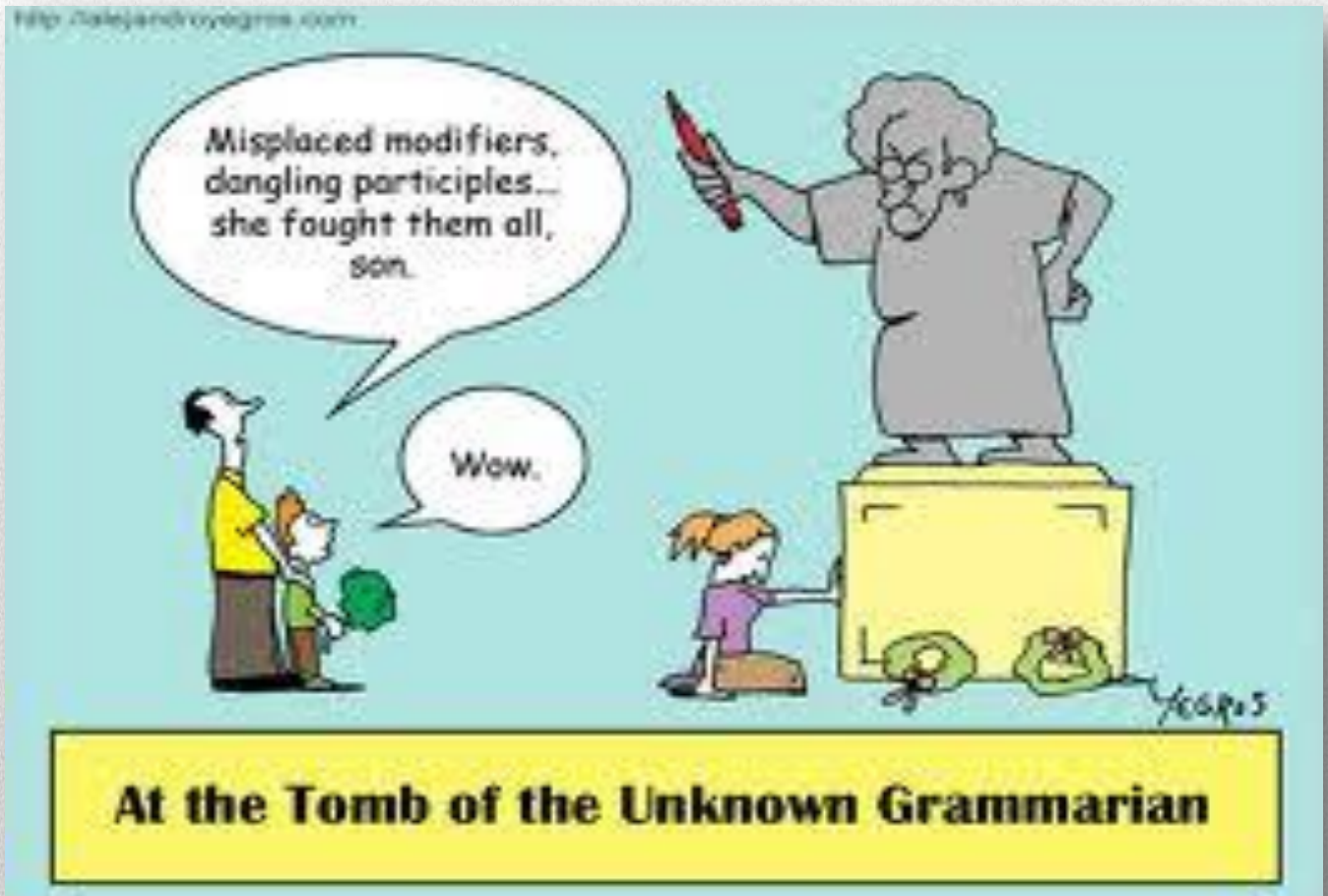


Image Source Page: <http://jeffreyhill.typepad.com/.a/6a00d8341d417153ef01310f66dd21970c-800wi>

Grammar and Punctuation Basics

Acronyms

- You **must** write out an acronym the first time you use it in the body of the paper.
- Write the term first and then put the acronym in parentheses.
- Also write out the acronym in the abstract. However, you also must write it out again when first used in the body of the paper.
- If you have a great many acronyms, and you use them frequently throughout the paper, it is a courtesy to your readers to provide a Glossary list at the end of your paper.

Acronyms

APA Style for numbers

- Words for 1-9 and numerals for 10 and above
- Use numerals for:
 - Units of time (except if approximate)
 - Dates
 - Ages
 - Numbers as part of series
 - SI units

IEEE Style for Math

- Variables are set in italic; vectors and matrices are usually boldface italic.
- Remove commas around variables in text.
- Always add a zero before decimals, but do not add after (e.g., 0.25).
- Spell out units in text without quantities (e.g., where the noise is given in decibels).
- Numbers and units used as compound adjectives should be hyphenated only if needed for clarity (e.g., 10-kV voltage; 5-in-thick glass).
- Use thin spaces (instead of a comma) between numbers in tens or hundreds of thousands (e.g., 60 000, 100 000, but 4000).
- Use zeroth, first, nth, (k+1)th, not 0th, 1st, 2nd, 99th, n th , (k + 1)st.
- Use the word “equation” at the start of a sentence only, but in text just use the number [e.g., in (1)], unless describing an equation, e.g., see “Darlington equation (1).”
- The slash is used in place of the word “per” when it leads to the clarity of the sentence (e.g., the ratio of 16 samples/s to 35 samples/s as compared to...).
- Use “indices” instead of “indexes” when referring to subscripts.
- Plural variables have an “s”.

Colons and Semi-colons

- This is a very common issue with engineering documents.
- Because most papers and proposals include difficult concepts and equations, it is very important to use commas and semicolons correctly in order to help the reader.
- Avoid the overuse of parentheses – again, this will cause ‘brain freeze’ in deciphering a lengthy and difficult sentence.
- After you have written your paper, read it as if you were the audience and try to break up the longer, more difficult sentences and paragraphs.

Hyphens

- If a noun is the object of the sentence, then the modifier before it is not hyphenated:

The diameter of the glass tube was 10 mm.

- If the noun is part of a modifying phrase, then hyphenate:

The glass tube had a 10-mm diameter.

i.e. and e.g.

- Engineering writing is very complex and hard to follow.
- In Latin, 'i.e.' means 'that is' and 'e.g.' means 'for example.'
- It will be easier on the reader if you simply use the English words instead of the Latin acronyms.

That and Which

- “**That**” is used with restrictive phrases – phrases that are essential to the sentence.
- “**Which**” is used with nonrestrictive phrases – phrases that are not essential to the sentence.
- When you use ‘which,’ a comma precedes it.

Different and Various

- ‘Different’ is best used in the context of two dissimilar items:

Two entirely different methods were used to analyze the process.

- ‘Various’ is best used to describe the use of several types of items, some similar, some not so similar.

Various studies in the literature alluded to this issue.

Please try to avoid:

Long, long sentences

- Rule of thumb: read it aloud, and if you have to take a breath to finish it, it is too long.
- Try to break up long sentences – your readers will thank you.

Long, long paragraphs

- One paragraph for one thought idea.
- If your paragraphs are too long, a key idea might be missed.
- Also, your readers give up trying to it.

Build-A-Phrase

Sometimes, you can have one too many nouns modifying an object, confusing the reader.

Category 1	Category 2	Category 3	Object
data	analysis	evaluation	mechanism
cost	estimation	probability	model
modified	full-scale	real-time	requirements
proposed	controlled	online	study
sustainable	variable	alternative	process
traditional	operational	derived	framework
potential	optimized	distribution	criteria
effective	dual	threshold	formation
relevant	intensive	testing	capabilities

Too many nouns modifying an object

Build-A-Phrase

Sometimes, you can have one too many nouns modifying an object, confusing the reader.

Example:

“in a tap-water-filled pan.”

C'mon guys!

“in a pan filled with tap water.”

Too many nouns modifying an object

In Conclusion

- Technical writing for papers, reports, and proposals take as much care as your actual research
- Different writing styles are used for papers, reports, and proposals
- Keep your reader in mind at all times
- Comply with the journal style guidelines
- Editing and refining your writing is a key part of the process