



Technical Writing for Papers, Reports, and Proposals

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Technical Writing Services for the College of Engineering

What I Do

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

Technical Writing Services

What this workshop is about

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



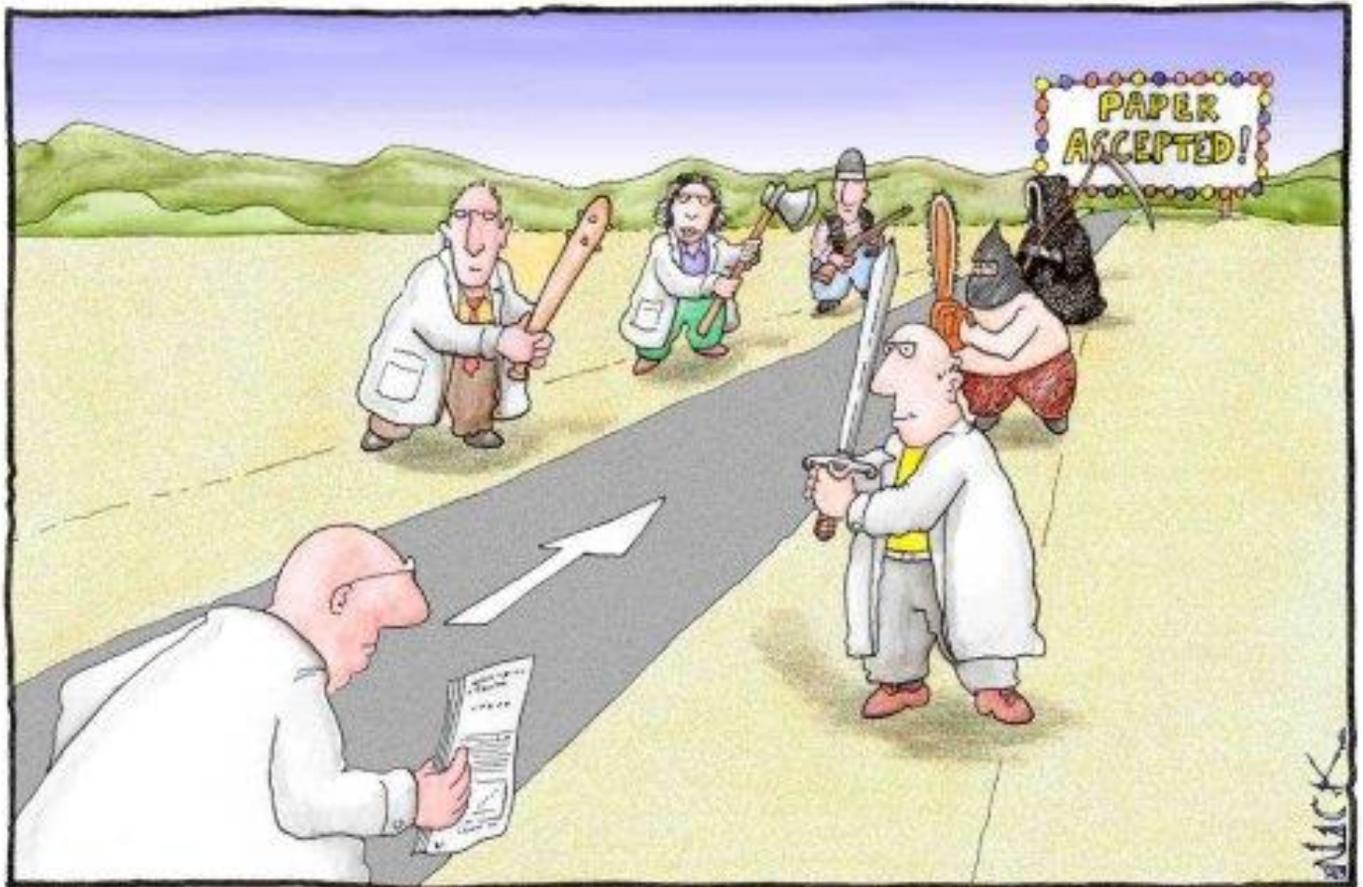
Most engineers assume that one form of technical writing will be sufficient for all types of documents.

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.'

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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.

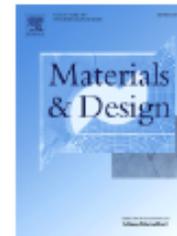
Understand who are your
secondary audiences.

Know your audience



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ISSN: 0261-3069

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.

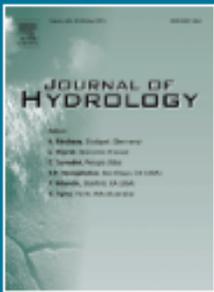
The technical level is postgraduate but not specialist, with an emphasis on developing practice rather than theory, for the field of **materials engineering** in preference to science, making appropriate links to processing. To reflect the multidisciplinary nature of design, submissions to *Materials & 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	<ul style="list-style-type: none">▪ 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	<ul style="list-style-type: none">▪ 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

Submit your paper

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View articles

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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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JOURNAL AUTHOR ACADEMY

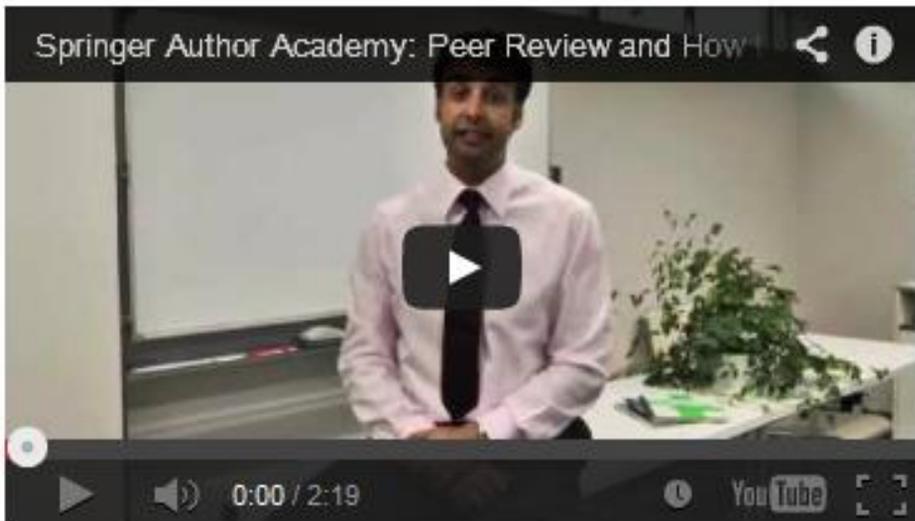
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How to Write and Publish Your Scientific Paper



Peer Review and How to Deal With It



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

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ASCE journals

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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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Corresponding author name:	
Email address:	

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Number of figure pages:	<input type="text"/>	
Number of table pages:	<input type="text"/>	
Estimated article pages:	<input type="text"/>	

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▸ [IEEE Style Manual](#)
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A manual outlining editorial guidelines for IEEE Transactions, Journals, and Letters.

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

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(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*.

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

† [top of page](#)

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

- › [Template and Instructions](#) (DOC, 131 KB)
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† [top of page](#)

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=m0znUO3QI8WkiQLA1oGABg&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*:

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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



Any questions?

... Let's take a 10-minute break.

2. Steps in Writing a Proposal



https://www.google.com/search?hl=en&site=imghp&tbm=isch&source=hp&biw=1280&bih=911&q=writing+a+proposal&oq=writing+a+proposal&gs_l=img.3..016j0i2414.1273.3959.0.5063.18.15.0.3.3.0.121.1234.13j2.15.0....0...1ac.1.32.img..1.17.1150.ilgbbqNxwvM#hl=en&q=writing+a+proposal+%2B+cartoon&tbm=isch&facrc=_&imgdii=_&imgrc=YnKPddtQAhY1QM%253A%3Bq7TaB5IEpt9EaM%3Bhttp%253A%252F%252Feducation.msu.edu%252Ffirtl%252Fgrad%252Fimages%252Finstructions_Cartoon.jpg%3Bhttp%253A%252F%252Feducation.msu.edu%252Ffirtl%252Fgrad%252Fwrite.asp%3B500%3B279

If you understand from the outset that the proposal process can be stressful, then you can plan your strategies more effectively.

Proposal writing is a **very** stressful process

- Tight deadlines.
- A great many rules and requirements.
- You are emotionally invested in the result.
- The stress increases with the number of collaborators involved.

Technical Writing for Proposals

Knowing who is reading and evaluating your proposal is extremely important.

As with papers, know your audience.

- Technical readers, not necessarily in your field of expertise.
- Financial and legal advisors.
- Government officials.

Technical Writing for Proposals

Your audience sees thousands of proposals

- They quickly know what is genuine and what is not.
- They want you to cut to the chase rather than create elaborate explanations.
- They want you to answer their questions very specifically.



Technical Writing for Proposals

In some proposal style guides, it is actually written “...if you do not comply with this format, **we will not look at your proposal.**”

You **must** follow the style guide or risk rejection

Sample proposal style guide

Grants.gov and Fast Lane for National Science Foundation (NSF) proposals

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg

Technical Writing for Proposals

If you don't create a calendar or checklist for milestones and deadlines, you risk either forgetting something or missing your deadline.

Create a milestones and deadline checklist

- This helps you keep track of all the forms and documents
- Give a copy to all collaborators, but make sure one person is responsible for tracking everything.
- Allow yourself plenty of 'slip room' in case of delays.

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Jan 1	2	3	4	5	6	7
		Kickoff meeting of collaborators			Bio sketches and current & pending support	
8	9	10	11	12	13	14
	1 st draft sections of Narrative		1 st draft of Project Narrative to Tech Writer		Complete all required forms and check	
15	16	17	18	19	20	21
		1 st draft Project Summary		1 st draft of Data Management Plan		
22	23	24	25	26	Jan 27	28
	1 st draft budget	Final drafts complete	1 st draft budget narrative to OSP	All final docs submitted to OSP	Deadline 5 pm EST	

Writing suggestions

- **Really** know your audience
- Know the style guide
- Write your heart out
- Check the details
 - Compliance to requested information
 - In-text citations and references
 - Conformance to style
 - Grammar and punctuation
 - Equations, figures, and tables
- Create a recognizable 'look'
 - We have done this for UNLV's College of Engineering
 - It is a recognizable logo in the footer
- **Know when to stop!**

Technical Writing for Proposals

Please try to avoid:

Using the word
“transformative” or
“innovative”

- This challenges the reader to refute your claim.
- Instead, write such a thoroughly good proposal that the reader will declare for themselves that your work is transformative or innovative.

Technical Writing for Proposals

Final thoughts

Winning a proposal is a complex process

1. Quality of research
2. Need for this kind of research
3. Quality of proposal writing
4. Political aspects
5. Funding aspects
6. Many more factors involved

The point of creating a well-written proposal is to make sure that elimination will not occur to due Factors 1, 2, and 3.

Errors common to engineers...

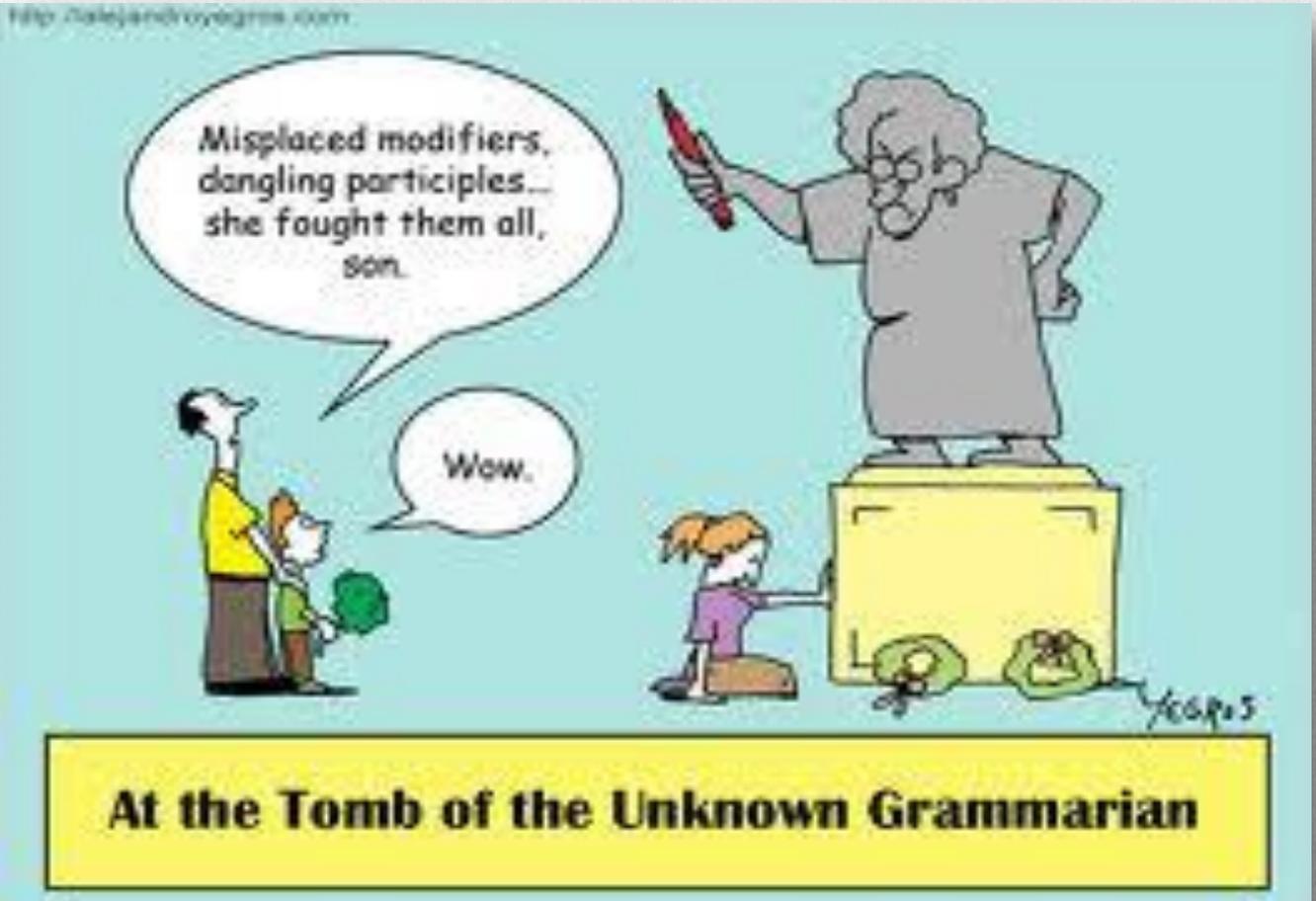


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Grammar and Punctuation Basics

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, n th, $(k+1)$ 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

Technical Writing for Engineers Workshop Series Spring 2014

Howard R. Hughes College of Engineering

Title of Workshop	Presenter	Date	Format
Technical Writing for Papers, Reports, and Proposals: The Basics	J. Longo	Feb 7, 2014	Graduate students and faculty are welcome to attend.
RefWorks for Engineers The Basics and How to Use Write N Cite	S. Wainscott	Mar 7, 2014	A refresher on the basics and advance material, including how to use Write N Cite with RefWorks. For faculty and graduate students.
Preparing a Paper for Publication <ul style="list-style-type: none"> • Basic outlining skills • Style formatting • Citations and References • Preparing Figures • Preparing Tables • Ethics 	J. Longo	Apr 4, 2014	Open only to participants of the Technical Writing for Papers and Proposals. Bring your paper to work on, either on your laptop or printed double spaced.
How to Write the Literature Review Section of Your Paper	J. Longo Sue Wainscott	Apr 2014 TBD	Sue Wainscott: The Literature Search Julie Longo: Writing Up Your Literature Review
Preparing a Fellowship Application	J. Longo	Apr 2014 TBD	Julie Longo: For graduate students who plan to prepare a fellowship application.

RefWorks for Engineers and Write-N-Cite

Technical Writing workshop series at
Howard R. Hughes College of Engineering

Sue Wainscott, the STEM Librarian for UNLV, will present a hands-on workshop on how to use RefWorks to create your bibliographies and reference lists.

This workshop will cover:

- The Basics
 - What citation management tools, like RefWorks, can provide to you
 - How to set up your RefWorks account
 - How to add and organize information within your RefWorks account
 - How to create a simple bibliography using RefWorks
- Advanced
 - An overview of a RefWorks tool, Write-N-Cite
 - How to download and install the correct Write-N-Cite on your computer
 - How to add in-text citations to your manuscript using the Write-N-Cite tool
 - How to create a custom bibliography for your manuscript using Write-N-Cite

This workshop will be held:

Friday, March 7

9 – 11:30 a.m.

SEB Classroom 1240

- All engineering faculty and graduate students are welcome to attend.
- Please register for RefWorks ahead of time at <http://www.library.unlv.edu/research/refworks>
- Also, please bring your laptop to this workshop.

To reserve your seat, please contact Julie Longo, email: julie.longo@unlv.edu or phone: 702-895-3721. Limit: 20

Thank you for your attention!