

BLG374E Technical Communication for Computer Engineers

Assist.Prof. Sefer BADAY

Week 1

Introduction to Engineering Writing Eliminating Noise in Engineering Writing - Part I

Syllabus

Week	Topic
1	Introduction to Course, Engineers and Writing Project Topics and group formation
2	Eliminating Noise in engineering writing Part 2
3	Writing Proposals (Proposal Defences) Bibliographies and Literature Reviews (Proposal Defences)
4	Collaborative Writing
5	Instruction/Explanation Writing
6	Writing Reports (Proposal Defences): Submit your project proposals
7	CV and Job Application Cover-letter
8	Plagiarism quiz
9	Graphics Charts tables
10	Submit Project reports with cover letter CVs and presentations
11	Formal letters, peer review (Presentations)
12	Executive Summaries & Abstracts (Presentations)
13	Computer Aids to Technical Communication (Presentations)
14	Project Presentation Reviews (Presentations)

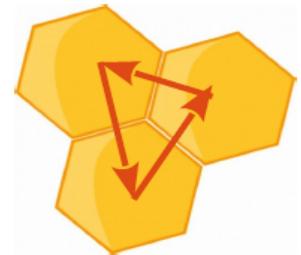
Lecture Notes

I'll be using lecture notes prepared by earlier instructors, including Esbie van Heerden, Damien Jade Duff, and probably others (though I may revise them).

BLG 374E

Technical Communication for Computer Engineers

Course Intro



- What and why of technical communication.
- Course structure.
- Assessment.
- Intro to technical communication.

Good Communication Is Necessary

"I'm just going to be a programmer".

Then you will be doing: Stakeholder management, client training, customer contact, functional specs, technical specs, negotiation, staff training, system design documents, user documentation, progress reports, briefings, project coordination, code commenting, handover training, user interviewing, etc...

Good Communication Is Necessary

"I'm just going to be an academic".

Then you will be doing: Paper writing, project proposals, project presentations, seminars, lecturing and training, tutorial documents, mentoring, publicising, poster design, collaboration, defense of your position, etc...

Good Communication Is Necessary

"I'm going to start my own business"

Then you will be doing: Marketing material preparation, applications for credit, advertising for employees, liaising with customers, market research, documentation, image management, stakeholder briefings, project management, specification documentation, constant email and letter communication, etc.

How To Acquire/Improve?

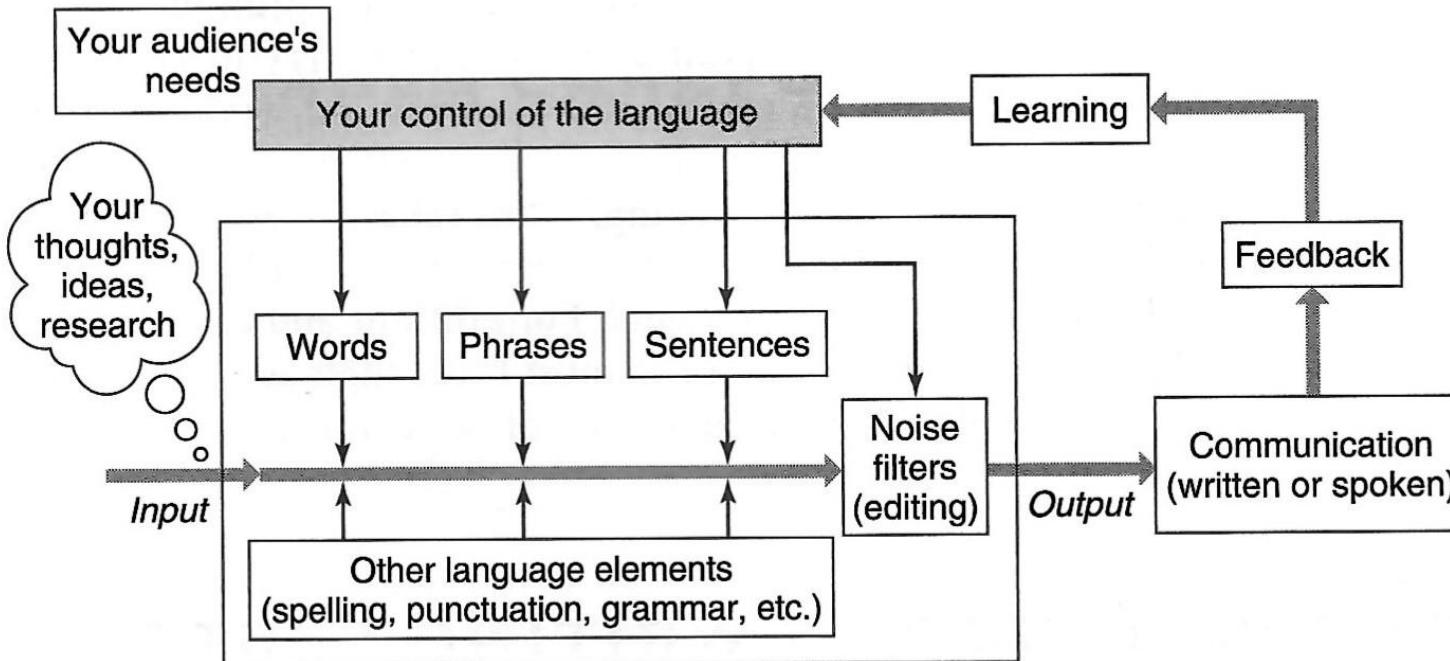


Figure 1-4 The process of communicating can be illustrated as a system with an input and output. How well the input is processed once it is in the system, i.e., how well you convey your information to others, will determine the impact of your message. From the response (feedback) you get, you will learn how to further improve the process.

Practice at every opportunity! → Fluency

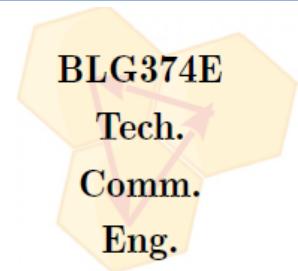
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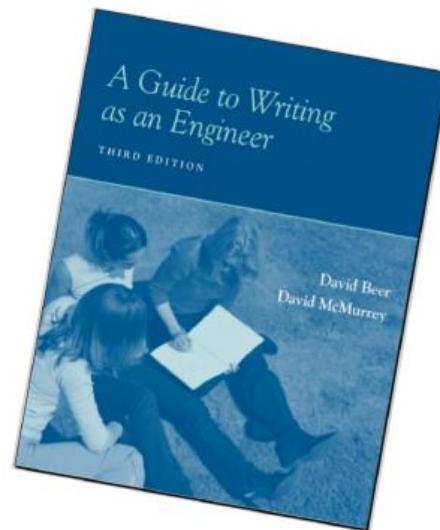
Scope of course

- Written communication.
 - Common Document Types. e.g. CV, Cover Letter, Project Proposal, Project Report
 - Format and Detail.
 - Style and Voice.
- Spoken communication. e.g. Project Presentation
 - Presentation skills.

Textbook

David Beer, David McMurrey (2009).
A Guide to Writing as an Engineer.
3rd or 4th Ed. Wiley: New Jersey, USA.

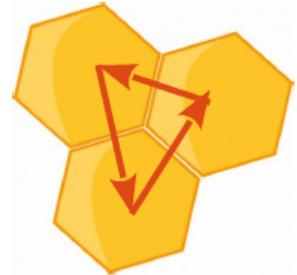
Also In library.



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Assessment

- Plagiarism Quiz (15%)
- Proposal (10%)
- Project Report+ CV+Cover Letter (45%)
- Project Presentation (30%)

Project Teams : 5 Students

Project Presentation : $2 \times 5 = 10$ min + 5 min Q/A

Project Topics

- An **experimental investigation**.
- Suggested topics:
 - *Performance analysis* of multiple algorithms (e.g. sorting algorithms).
 - *Usability analysis* of open-source software (e.g. video-editing software).
 - Your own topic.

Workload

- ECTS Credits: **3**
- Total workload:
 $3 \times 25.5 = 76.5 \text{ hours}$
- Weekly workload (14 weeks):
 $76.5 / 14 = 5.5 \text{ hours.}$
 $= 2 \text{ hours in-class} +$
 $3.5 \text{ hours preparing documents or presentations.}$

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Kinds of technical communication

- Written:
 - Formal.
 - Informal.
- Spoken:
 - Formal.
 - Informal.

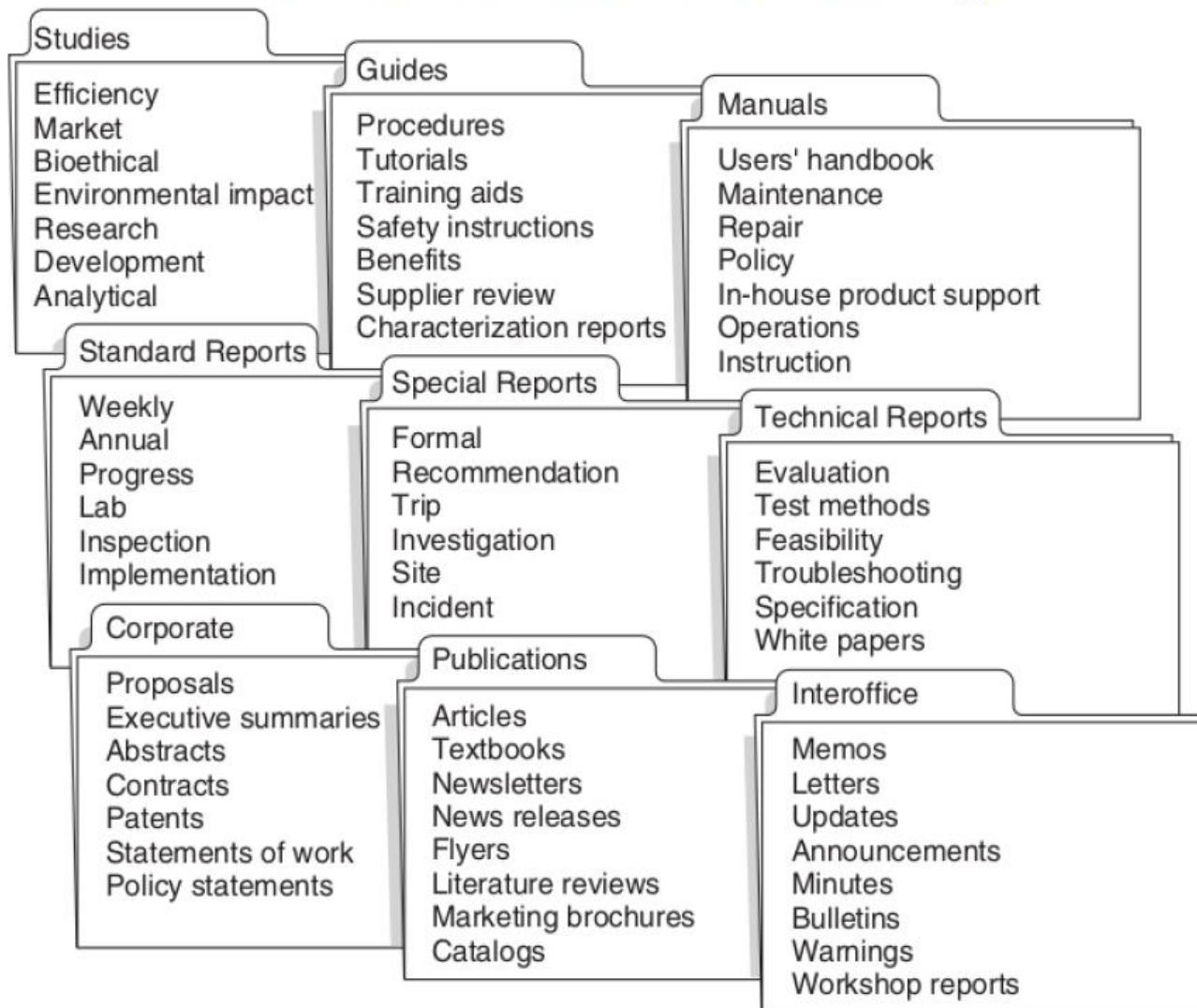
Working Day Of A Typical Engineer

- Verbal
- Written

Friday's Schedule 2/15/08	
●	7:30 <i>Arrive, read and reply to several overnight emails.</i>
●	8:00 <i>Work on project.</i>
● ●	10:30 <i>Meet with project manager to write answer to department head request.</i>
●	11:00 <i>Write up a request to obtain needed technical support.</i>
●	11:30 <i>Lunch.</i>
● ●	12:00 <i>Meet with server group about submitted application to fix process problems.</i>
●	12:20 <i>Reply to emails from Sales about prospective customers' technical questions.</i>
●	12:30 <i>Write to software vendor about how our product works with their plans.</i>
●	1:00 <i>Give presentation to server hosting group to explain what my group is doing.</i>
● ●	2:00 <i>Join the team to write up weekly progress report.</i>
●	2:30 <i>Write emails to update customers on the status of solving their problems.</i>
●	2:45 <i>Write email reply to question about knowledge base article I wrote.</i>
● ●	3:00 <i>Meet with group to discuss project goals for next four months.</i>
● ●	3:30 <i>Meet with group to create presentation of findings to project management.</i>
●	4:00 <i>Work on project.</i>
●	5:00 <i>Leave for day.</i>

Figure 1-1 The working day of a typical engineer calls for plenty of communication skills.

Kinds of writing



Communication for engineers: The aims

- Communicate message.
 - Eliminate barriers.
 - Ambiguity.
 - Confusion.
 - Loss of meaning.

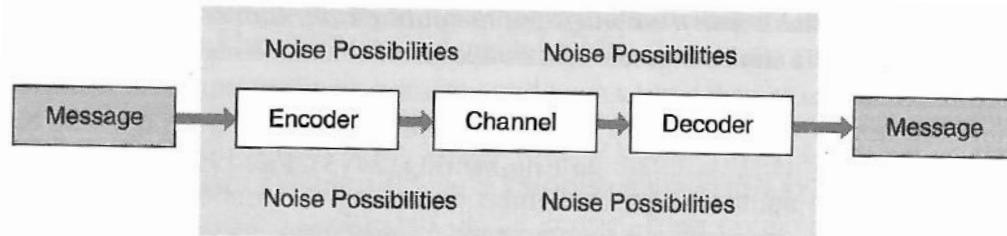


Figure 1-3 In noise-free technical communication, the signal flows from the encoder (writer, speaker) to the decoder (reader, listener) without distortion or ambiguity. When this occurs, the received message is a reliable version of the sent one.

- Communicate message.
 - Eliminate barriers.
 - Ambiguity.
 - Confusion.
 - Loss of meaning.

Some Examples

weren't

When they bought the machine they weren't aware of its shortcomings.

They were under the allusion that the project could be completed in six weeks.

illusion

There was not a sufficient enough number of samples to validate the data.

There weren't enough samples to validate the data.

Our intention is to implement the verification of the reliability of the system in the near future.

We want to verify the system's reliability soon.



Communication for engineers: The aims

- Manage impressions.

“The image others get of you is largely formed by how well you communicate.”

Thus Robert W. Lucky, former Executive Director of AT&T Laboratories and head of research at Telcordia Technologies, and an accomplished writer himself, points out:

It is unquestionably true that writing and speaking abilities are essential to the successful engineer. Nearly every engineer who has been unsuccessful in my division had poor communication skills. That does not necessarily mean that they failed because of the lack of these skills, but it does provide strong contributory evidence of the need for good communication. On the contrary, I have seen many quite average engineers be successful because of above-average communication skills.

rlucky@telcordia.com Accessed August 20, 2008

Communication for engineers: The aims

- Communicate message.
 - Imagine you are the reader.
 - A skill to learn.

Think of all those times when you were the listener in a bad presentation, remember why it was bad and don't repeat the same mistakes.

Same thing goes for bad written material, such as papers and reports.

Eliminating Noise in Engineering Writing

Part I



I am not a picky person when it comes to spelling and grammar, but when I see a report or memo which has repeated errors I immediately question the ability and dedication of the person who wrote it. Why didn't they take the time and effort to do it right? Most of the successful engineers I know write clear, well-organized memos and reports. Engineers who can't write well are definitely held back from career advancement.

Richard L. Levine, Manager, Bell Northern Research, 1987

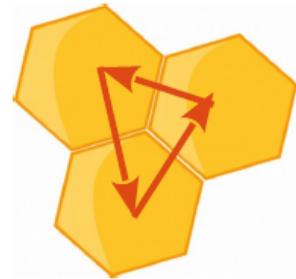
There arises from a bad and inapt formation of words, a wonderful obstruction of the mind.

<https://www.amazon.com/Engineer/dp/0470417013>

Sir Francis Bacon 1561–1626

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Technical Communication for Computer
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Eliminating Noise In Engineering Writing



- Sorting out spelling.
- Punctuation primer:
 - When to use the comma.
 - When to use the semi-colon.
 - Quotes and punctuation: how to combine them.
- Grammar hints:
 - When pronouns go wrong.
 - What is parallelism and how to respect it.
 - Avoiding sentence fragments.
 - Active vs. passive voice: when to use which.
 - English is a sexist language – how to deal with that?
 - Prepositions aren't necessarily pre-positioned.
- Style hints:
 - Don't use long sentences.
 - Define terms and acronyms.
 - How to use math.

Spelling

- Spell-checker: YES.
 - Dictionary
 - What is the plural of appendix?
 - Is it Python or PYTHON or python?
 - What is the past tense of input?
 - Etc.
- appendices
- inputted.
- inputting (gerund)

Punctuation: when to use commas

- Often optional.
- Rule #1: where a small pause in speech is warranted.
- Examples

After the construction workers finished eating, rats emerged to look for the scraps.

In all, the containers were in good condition considering the rough journey.

As you can see, the efficiency peaks around 10–12%.

If an acoustic horn has a higher throat impedance within a certain frequency range, it will act as a filter in that range, which is undesirable.

Serial Comma

One more point about commas: Most technical editors prefer what is called a “serial comma” when you list words or ideas within a sentence, as in *The serial comma has become practically mandatory in most scientific, technical, and legal writing*. You may have been told that the *and* joining the last two terms replaces the need for a comma, but this is not so in technical writing. See how the serial comma is useful in the following sentences by reading them aloud and noting how you need the pause before the *and*:

Fresnel’s equations determine the reflectance, transmittance, phase, and polarization of a light beam at any angle of incidence.

Tomorrow’s engineers will have to be able to manage information overload, communicate skillfully, and employ a computer as an extension of themselves.

Serial Comma

A serial comma may also prevent confusion:

Rathjens, Technobuild, Johnson and Turblex build the best turbines for our purposes.

Unless *Johnson and Turblex* is the name of one company, you will need a serial comma:

Rathjens, Technobuild, Johnson, and Turblex build the best turbines for our purposes.

Punctuation: when to use the **semicolon**

- Between independent clauses.
 - Could be replaced by a period between 2 sentences.
 - But signals greater connection.

Programming is easy if you have a passion for it. I have a passion for it.

- Also if a list has extra commas.

In order to write well you need: a pencil, to write with, and to nibble on; a piece of paper to write on, and to doodle on; and the motivation to write.

Punctuation: when to use the **semicolon**

Your program is working well, however mine is a disaster.

Take Professor Hixson's class. You'll find he's a great teacher.

The relationship between these statements could be better stressed by using a semicolon:

Your program is working well; however, mine is a disaster.

Take Professor Hixson's class; you'll find he's a great teacher.



Punctuation: when to use the **semicolon**

We wanted to finish the computer program yesterday; however, the network was down all afternoon.

We wanted to finish the computer program yesterday, however, the network was down all afternoon.



Where does “however” belong?

Punctuation: when to use the **semicolon**

If you frequently use words like *however*, *therefore*, *namely*, *consequently*, and *accordingly* to link what could otherwise be two sentences, insert a semicolon before and a comma after them. You'll find this will add a shade of meaning that cannot be achieved otherwise.

Colons

For the final exam you will need several items: a pencil, a calculator, and three sheets of graph paper.

You should *not* write the example sentence as

For the final exam you will need: a pencil, a calculator, and three sheets of graph paper,

because what comes before the colon makes no sense by itself and the colon needlessly interrupts the flow of the sentence. Instead write

For the final exam you will need a pencil, a calculator, and three sheets of graph paper.

Dashes

- Emphasis: Staying up all night to finish a lab project is not so terrible—once in a while.
- Summary: Reading all warnings, wearing safety glasses and hardhats, and avoiding hot materials—all these practices are crucial to sensible workshop procedure.
- Insertion: My opinion—whether you want to hear it or not—is that the drill does not meet the specifications promised by our supplier.

Notice we're talking about the "em" dash here—the dash used between words that practically touches the letters at each end of it, and which we have used in this sentence. The "en" dash is shorter, slightly longer than a hyphen, and used when you cite ranges of numbers: 31–34; \$350–400. Most word processing programs allow you to choose whichever you need.

- N ← "en" dash
- M ← "em" dash

Hyphen

Coop

vs.

Co-op: Co-operative

ArtWorks Décor

Hyphen

The transistor is a twentieth-century invention

Don't hyphenate prefixes such as *pre-*, *re-*, *semi-*, *sub-*, and *non-* unless leaving out a hyphen causes an eyesore or possible confusion. *Preconception* is fine, but *preexisting* needs a hyphen if only for looks. The same might be said of *antiinflationary*, *ultraadaptable*, or *reengineering*. You may have to distinguish between *recover* (regain) and *re-cover* (to put a new cover on) and the like at times. Again, a good dictionary will help.

Avoid	Use
Re-design	Redesign
Sub-question	Subquestion
Un-needed	Unneeded

Hyphen

Avoid	Use
Early-warning system	Early warning system
Optimally-achieved goals	Optimally achieved goals
Highly-sensitive cameras	Highly sensitive cameras

What is “early”, “optimal” or “high” is evident. No need to indicate further.

Clear Benefits of Using a Hyphen

We used a 16 key keypad.

We used a 16-key keypad.

We knew Marienett made klystrons would be able to generate a 9.395 GHz microwave.

We knew Marienett-made klystrons would be able to generate a 9.395 GHz microwave.

The equation assumes a one dimensional plane wave propagation inside the horn.

The equation assumes a one-dimensional plane-wave propagation inside the horn.

Research showed the computer aided students improved their grades dramatically.

Research showed the computer-aided students improved their grades dramatically.

Avoid Exclamation Points!

Avoid it in professional writing, except in the case of warnings!

DANGER: Sodium Cyanide is extremely toxic!

Punctuation: quotes and punctuation

Always

Put , and . inside quotes

Put ; and : outside quotes

Punctuation: quotes and punctuation

The manager stressed to the whole group that the key word was “Preparedness.”

“The correct answer is 18.2 Joules,” he told me.

We had heard about the “Four-Star Marketing Plan,” but no one remembered what it involved.

We left the game right after the band played “The Eyes of Texas”; it was too darn hot and humid to stay any longer.

Punctuation: quotes and punctuation

Sometimes the question of where to put question marks with brief quotations arises. The solution is quite simple: If the question mark applies only to what is within the quotes, it goes inside the final quote marks. No period follows after the quotation marks. If it applies to the whole sentence, it will go outside the final quote marks:

Their manager bluntly asked, “Are we on schedule?”

What is the meaning of the term “antepenultimate”?

Punctuation: quotes and punctuation

If you need to quote material that takes up more than two lines, set it off from your text by a space and indent it from both right and left margins. You might even use a slightly smaller font size, and you should omit the quotation marks, as shown here:

According to the author, specifications should not be written by a single person:

The lead engineer delegates the writing of numerous sections to specialists, who may not be aware of the overall goals of the project, and may have parochial views about certain requirements. The lead engineer is faced with the difficult task of fitting all these pieces together, finding all the places where they may conflict, and adjusting them to be correct and consistent with each other [NAWCTSD Technical Report 93-022, p.11].

The importance of consistency cannot be overstressed in the production of ...

Beer & McMurrey (2009)

Subject-Verb Agreement

This combination of electrical components constitute a single-pole RC filter.

A 35 mm film of some high buildings are strongly recommended.

Only one of the pre-1925 high-rise structures were damaged in the quake.

Avoid Omitting the Subject

Jumping briskly into the saddle, the horse galloped across the prairie.

After testing the mechanism, the theory behind it was easily understood.

Once having completed needed modifications and adjustments, the equipment operated correctly and met all specifications.



Jumping briskly into the saddle, the outlaw galloped across the prairie.

After testing the mechanism, we easily understood the theory.

Once we had completed needed modifications and adjustments, the equipment operated correctly and met all specifications.

Keep Verb Modifiers Nearby

I was ordered to get there as soon as possible by fax.

By the age of 4 his father knew he would be an engineer.

I was ordered by fax to get there as soon as possible.

The father knew, when the son was 4 years old, that his son would be an engineer.

Keep Subject Modifiers Nearby

The tone-detector circuit was too unreliable to be used in our telephone answering device, which was built of analog devices.



The tone-detector circuit, which was built of analog devices, was too unreliable to be used in our telephone answering device.

Use of pronouns. To what exactly are you referring?

Careful examination of an algorithm allows us to understand better the fundamental principle behind the algorithm. This is the key to improving it.

Careful examination of an algorithm allows us to understand better the fundamental principle behind the algorithm. *Understanding that fundamental principle* is key to improving the algorithm.

Use of pronouns. To what exactly are you referring?

We will study the terrain by soil analysis and computer simulation before reaching a decision on whether construction can take place here. **This** will also enable us to ...

What does the *This* refer to in the second sentence—study, terrain, analysis, simulation, decision, or construction? According to accepted usage, it should be *construction* since it's the last noun before the pronoun *This*, but that's unlikely to be what the writer meant. The meaning would be much clearer if the second sentence read something like this:

This study will also enable us to ...

Use of pronouns. To what exactly are you referring?

Ambiguous: Back in 1954, three researchers made a series of discoveries about the unknown sources of Barbour's early notebooks.
These prompted them to further investigate ... ?

Clearer: These discoveries prompted the three to further investigate
...

Next Week:

Eliminating Noise in Engineering Writing

Part II

**Parallelism, Sentence Fragments, Sentence Voice, Gender-Neutral Language,
Prepositions, Infinitives, Transitions, Sentence Length, Jargon Use,
Acronyms/Initialisms, Numbers, Units, Equations**

Assignment

- Explain why you chose Computer Engineering for your undergraduate studies, in about 250 words.
- Pay attention to the noise-elimination techniques presented in this lecture
- Submit your text via **turnitin** by 23:59 on February 21st, 2024.