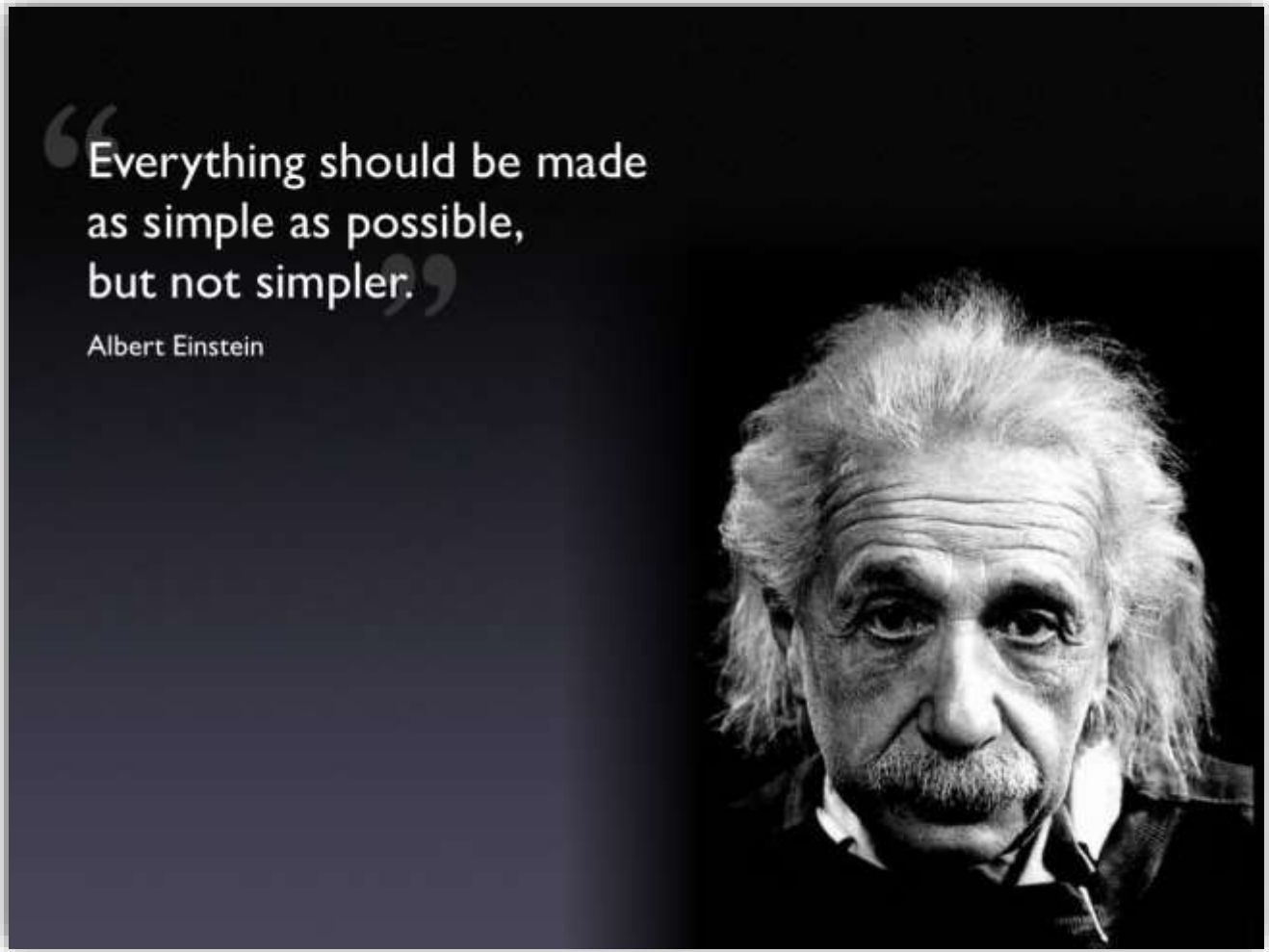
CALIFORNIA STATE UNIVERSITY
LONG BEACH

Introduction to Scientific Research Communication

ENGR 361: Scientific Research Communication

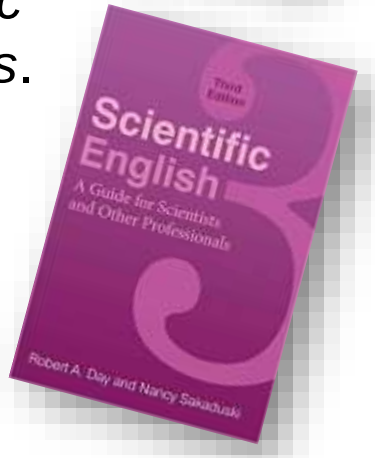
https://www.csulb.edu


“Everything should be made as simple as possible, but not simpler.”
Albert Einstein

References

- Alred, G. J., Brusaw, C. T., & Oliu, W. E. (2009). *Handbook of technical writing*. Macmillan.

- Day, R. A., Sakaduski, N., & Day, N. (2011). *Scientific English: A guide for scientists and other professionals*. ABC-CLIO.



Lecturer

- Brian L Ruhe, PhD, CP
- brian.ruhe@csulb.edu
- Office: Virtual Zoom Room

- Office Hours:
  - Thursday: 2:00 PM to 3:00 PM
  - Or By Appointment

Syllabus

- Scientific Research Communication
  - Success through effective & clear communication

- Syllabus

- Students enrolled in the course after the first two class meetings implicitly agree to the terms of the syllabus

Course Objectives

- Appreciate the **importance of clear effective communication** in all aspects and stages of research process
- Know how to **acquire and access scientific information**
- Understand the **structure of the research article**

Course Objectives

- Know how to **organize and present data** in formats appropriate to various purposes

- Understand basic rules of English grammar and syntax so that **writing maximizes clarity and understanding**

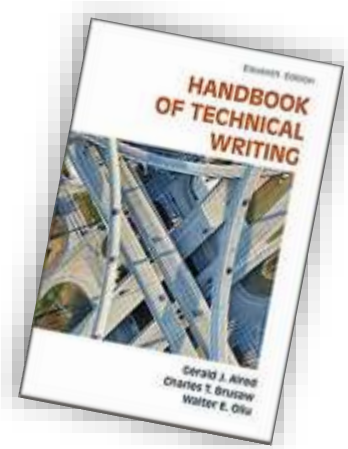
- Understand rhetorical styles that **emphasize reader-based texts**

Course Objectives

- Write for a **variety of audiences**
- Know how to craft an **oral presentation of technical information**
- Know how to **write persuasively**
  - Crafting a **pilot study grant proposal**

Course Materials

- Textbooks



- Items for class

Lectures

- Lectures will be given on specific topics that are integral to the course
- **We will focus on open discussions**

Course Etiquette & Participation

- Be Prompt
- Be Prepared
- Be Positive
- Be Productive
- Be Polite

- Use the Chat box!

Course Communication

- BeachBoard Announcements
- Email
- Course content is subject to change
- Changes will be announced in class and/or posted on course website

Assignments & Evaluations

- Assignment 1: Standards of Your Field 10%
- Assignment 2: Prep Ex., Cover Letter, & Resume 10%
- Assignment 3: Personal History Statement 15%
- Assignment 4: Research Report 15%
- Assignment 5: Research Poster 10%
- Assignment 6: Written Grant Proposal 15%
- Assignment 7: Oral Presentation Grant Proposal 10%
- Class Participation & Final Project 10%
- Peer Evaluation For assignments 6 & 7 5%

- Class participation will include, in-class assignments, peer-review, discussions, and Final in-class activity
- Final letter grades will be decided by the quality of your work

Schedule – Section 04

Week	Date	Topic	Notes
1	08/24	Introduction to Scientific Writing	
	08/26		
2	08/31	CSULB Library workshop	
	09/02		
3	09/07	**LABOR DAY – NO CLASS**	
	09/09	Resume/CV and Cover Letters	DUE: Standards of Field
4	09/14	Writing for Understanding (READ Boiarsky)	
	09/16	Personal Statements for Graduate School/Employment	DUE: Résumé/CV Cover Letter
5	09/21	Elements of Scientific Writing	
	09/23	Elements of the Research Paper	DUE: Personal Statement Part I
6	09/28	Data/Sources / Writing the Research Report	
	09/30	Techniques for Scientific Writing	DUE: Research Report – Source of Data
7	10/05	Process of Effective Writing	
	10/07		DUE: Research Report – 1st Draft
8	10/12	Improving your Sentences	DUE: Personal Statement Part II
	10/15	Peer Review of Draft #2 (During class time)	DUE: Research Report – 2nd Draft
9	10/19	Graphic presentation of information & the scientific	
	10/21	poster	
10	10/26	Persuasive writing: Research Proposal writing	DUE: Research Report – Final Paper
	10/28		DUE: Research Poster
11	11/02	Hypothesis Development	
	11/04	Writing Grant Proposals	DUE: Grant Prospectus
12	11/09	Writing Grant Proposals	
	11/11	**VETERANS DAY – NO CLASS**	
13	11/16	Putting together an oral presentation	DUE: Proposal 1st Draft
	11/18		
14	11/23	Peer Review of Proposals	DUE: Proposal 2nd Draft
	11/25	**FALL BREAK – NO CLASS**	
15	11/30	Practice Oral Presentations	
	12/02		
16	12/07	Final Oral Presentations	DUE: Final Proposal & Presentation Slides
	12/09		
17	12/16	Final Activity (TBD) Wednesday, 12/16, 5:00 PM – 7:00 PM	

Schedule – Section 05

Week	Date	Topic	Notes
1	08/25	Introduction to Scientific Writing	
	08/27		
2	09/01	CSULB Library workshop	
	09/03		
3	09/08	Writing reader-based texts (for Understanding)	
	09/10	Resume/CV and Cover Letters	DUE: Standards of Field
4	09/15	Writing for Understanding (READ Boiarsky)	
	09/17	Personal Statements for Graduate School/Employment	DUE: Résumé/CV Cover Letter
5	09/22	Elements of Scientific Writing	
	09/24	Elements of the Research Paper	DUE: Personal Statement Part I
6	09/21	Data/Sources / Writing the Research Report	
	10/01	Techniques for Scientific Writing	DUE: Research Report – Source of Data
7	10/06	Process of Effective Writing	
	10/08		DUE: Research Report – 1st Draft
8	10/13	Improving your Sentences	DUE: Personal Statement Part II
	10/15	Peer Review of Draft #2 (During class time)	DUE: Research Report – 2nd Draft
9	10/20	Graphic presentation of information & the scientific	
	10/22	poster	
10	10/27	Persuasive writing: Research Grant Proposal writing	DUE: Research Report – Final Paper
	10/29		DUE: Research Poster
11	11/03	Hypothesis Development	
	11/05	Writing Grant Proposals	DUE: Grant Prospectus
12	11/10	Writing Grant Proposals	
	11/12	Tips for Writing Grant Proposals	
13	11/17	Putting together an oral presentation	DUE: Proposal 1st Draft
	11/19		
14	11/24	Peer Review of Proposals	DUE: Proposal 2nd Draft
	11/26	**FALL BREAK – NO CLASS**	
15	12/01	Practice Oral Presentations	
	12/03		
16	12/08	Final Oral Presentations	DUE: Final Proposal & Presentation Slides
	12/10		
17	12/17	Final Activity (TBD) Thursday, 12/16, 7:15 PM	

Student Requirements

- **Regular attendance is expected**, as many discussions and activities are nearly impossible to replicate outside of class (collected via Zoom Reports)

- **Effort will be an important aspect for evaluation**
  - Achieved by working purposefully through the process
    - **Submitting assignments on time**
    - **Following instructions**
    - **Completing all parts of the assignment and/or exercise**
    - **Asking questions**
    - **Asking for feedback**
    - **Attending class**

Student Responsibilities

- Read the text, **ask questions**, take notes, engage in discussions, and work through the exercises and projects

- Through every mistake, question asked, and success in assignments your brain grows a little bit stronger

Grades

- **A -** performance at the **highest level** showing **sustained excellence.**

- **B -** performance at **high level** showing **consistent and effective achievement.**

- **C -** performance at an **adequate level** meeting **basic requirements.**

- **D -** performance is **less than meeting minimum course requirements.**

- **F -** performance where **even minimal course requirements were not met. Cheating or Plagiarism.**

Now, a little about you . . .

- Name
- Major
- Unique Talent?

Do you believe your brain can grow?

- Growth Mindset
  - Neuroplasticity by Sentis (2:03) - a good visual introduction to the concept of how the brain can be rewired as we learn and think differently.
  - Growth Mindset video by Infobundl (2:31) - a short talk on how everyone can have a growth mindset.
  - Growing your mind by Khan Academy (3:04) - Sal Khan explains how your brain grows when you struggle with problems.

Growth Mindset

- A Growth Mindset drives motivation and achievement

https://www.mindsetworks.com/science/

Why this Course?

- Exposure to types of writing and speaking commonly practiced by scientists

- "*In science, the credit goes to the man that convinces the world, not the man to whom the idea first occurs*." -Sir William Osler

Writing is …

In-Class Activity

- Write a short essay that describes your strengths and challenges in writing
- Include your name, course, and section #
- Double spaced
- Save for next class…

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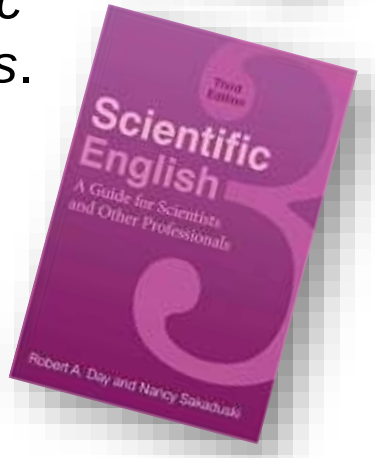


Scientists WRITE Constantly!

- All phases of the scientific process require writing
  - Understanding what's known
  - Planning a research project
  - Planning an experiment
  - Recording a protocol and data
  - Reporting the results
  - Writing grant proposals

Writing promotes clear thinking ⟷ Good writing reflects clear thinking

Scientific Communication

- Effective Communication
  - Clear
  - Useful
    - Educate
    - Inform
    - Record
  - Persuasive

Scientific Communication

- Hard Work!!
- "*Easy reading is damned hard writing.*"

-Nathaniel Hawthorne

Scientific Communication

- Emphasis on a reader/listener-centered approach

Scientific Communication

- Communication is critical for career advancement
- Speaking and writing well greatly impact your personal and professional success

- Technical prowess: necessary but not sufficient

Scientific Communication

- Presenting yourself as a professional …

Scientific Communication

- Your writing reflects who you are

Less than ideal statements in a job application cover letter:

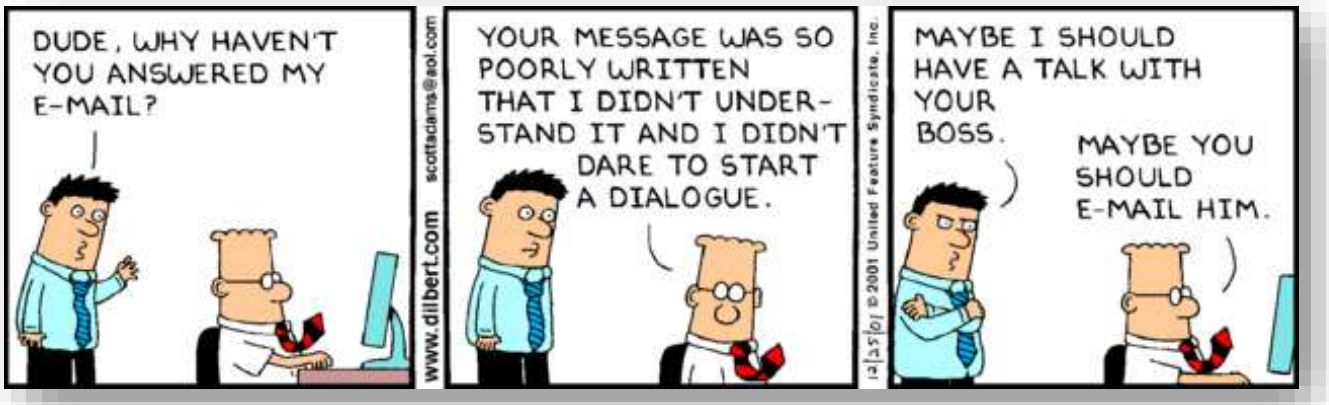
"My name is ____, and I kick ass. See resume for details."

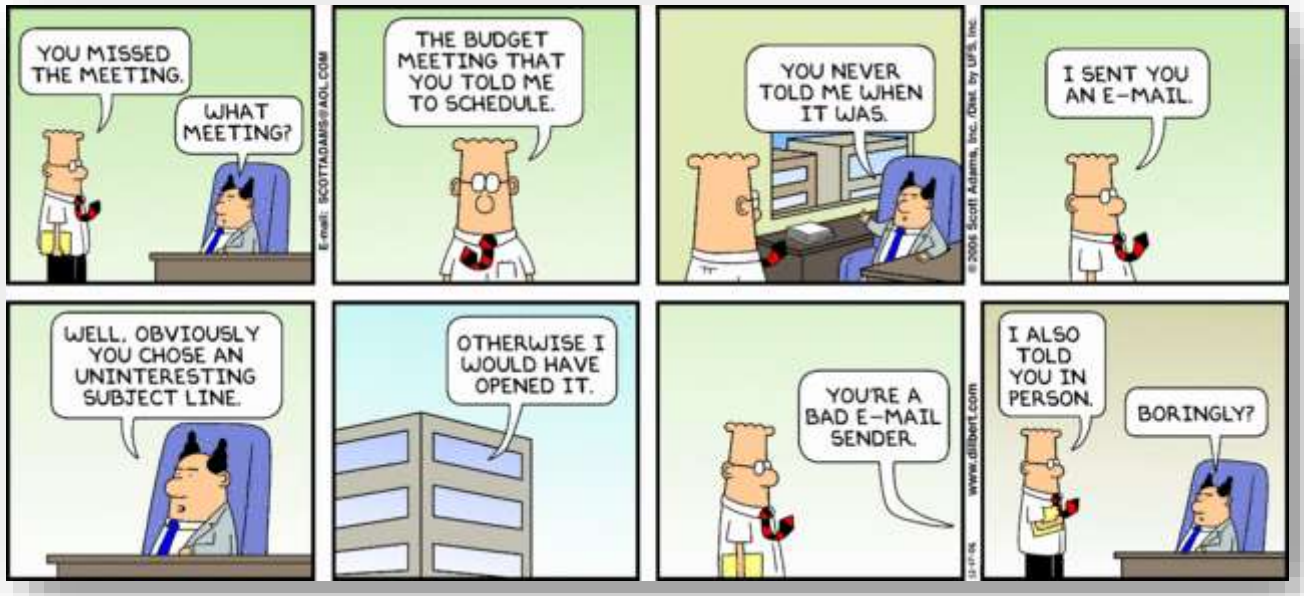
"When I find a product I like I tell everyone I know and love about the product I discovered and how it will make their life better."

Writing is a Daily Activity

- Common writing tasks
  - **Emails**
  - Personal & business correspondence
  - Activity planning (to-do lists)
  - Keeping a calendar
  - Course preparations
  - Doing research
  - Other

Scientific Communication
Emails





Routine Communications
Emails & Memos

- Email
  - One of the most common form of written communication used today
  - Internal messages that stay within an organization and for external communication with people outside the organization

- Memos
  - Used for internal documents and in organizations in which some employees may not have easy access to computers

Scientific Communication
Emails

- "Rules"
  - Provide a subject line
  - Use a professional email address
  - Do not write in all UPPERCASE letters or in all lowercase letters
  - Review and PROOFREAD your messages
  - Include a signature line with title, company, and contact information

Routine Communications
Emails

- Writing Emails
  - Avoid sending the first draft without revision
  - Include all crucial details
  - Look for (PROOFREAD)
    - Grammatical errors
    - Factual errors
    - Ambiguities
    - Unintended implications

Routine Communications
Emails

- Writing Emails – Confidentiality
  - Email can easily be forwarded
  - Messages are never truly deleted
  - Companies can be compelled to provide email records in a court of law
  - Strategy
    - Write draft and revise your email before filling in the “To” line

Routine Communications
Emails

- Writing Emails – Workplace '***n*Et**'iquette
  - Maintain high level of professionalism
  - No jokes, spam, gossip, biased language
  - Provide a suitable subject line
  - Include a cover message for emails with attachments
  - Avoid abbreviations
  - Sign the email, use a signature block

Routine Communications
Emails

- Writing Emails – Ethics
  - The Blind Copy (bcc)
    - Can be used ethically protecting the privacy of email addresses for a large group of recipients
    - Use of bcc is unethical if you send sensitive or confidential information to a third party without the original recipient's knowledge
    - Unethical to use it to play office politics

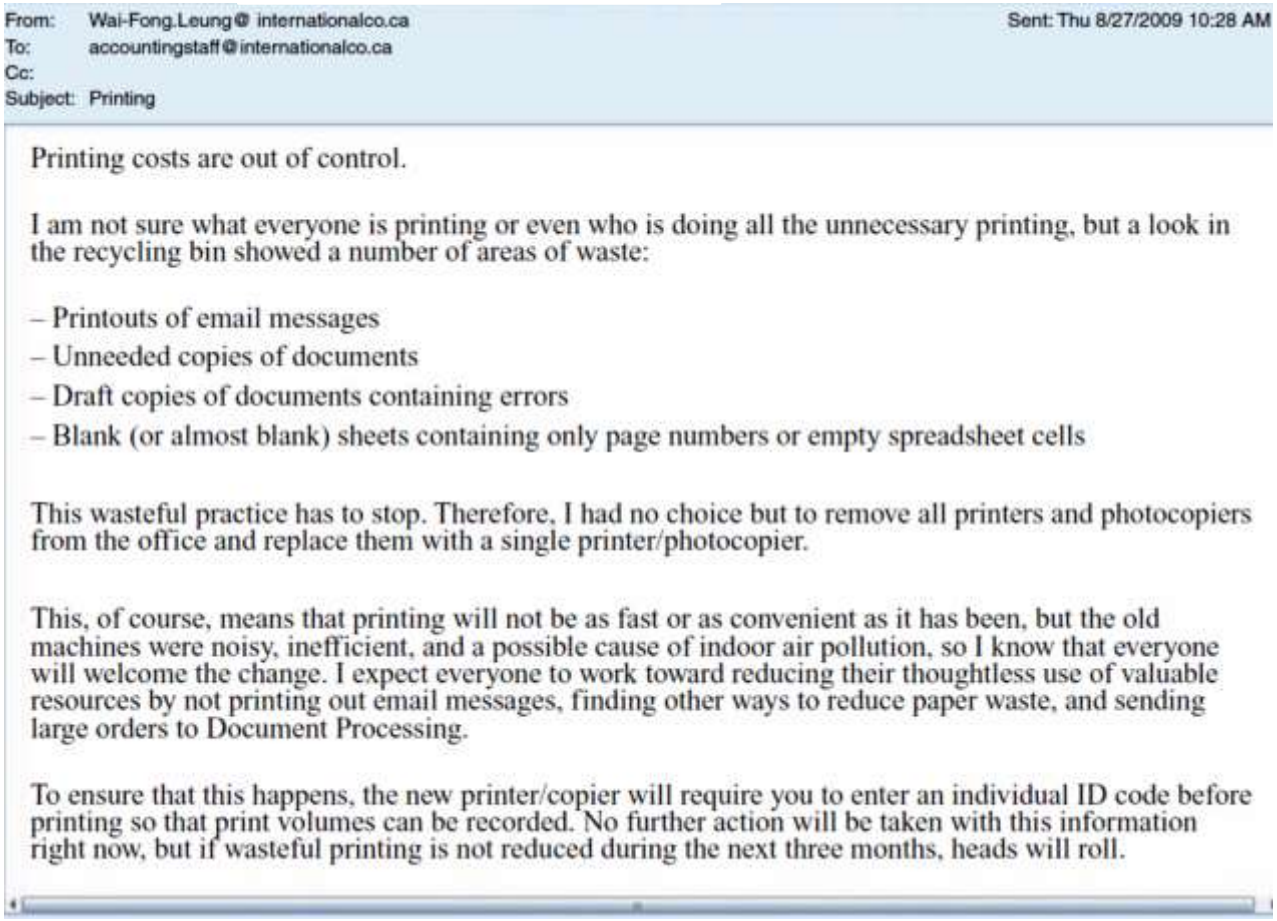
Routine Communications
Emails

- Writing Emails – Content Considerations
  - Use short paragraphs to avoid dense blocks of text
  - Being with an overview paragraph for long messages
  - Begin with the most important ideas
  - End when you have provided all necessary information
  - Provide only necessary details

- ***"I am sorry for the length of my letter, but I had no time to write a short one."*** –Blaise Pascal

Routine Communications
Emails

- Email



From: Wai-Fong.Leung@ internationalco.ca
To: accountingstaff@internationalco.ca
Cc:
Subject: Printing
Sent: Thu 8/27/2009 10:28 AM

Printing costs are out of control.

I am not sure what everyone is printing or even who is doing all the unnecessary printing, but a look in the recycling bin showed a number of areas of waste:

– Printouts of email messages
– Unneeded copies of documents
– Draft copies of documents containing errors
– Blank (or almost blank) sheets containing only page numbers or empty spreadsheet cells

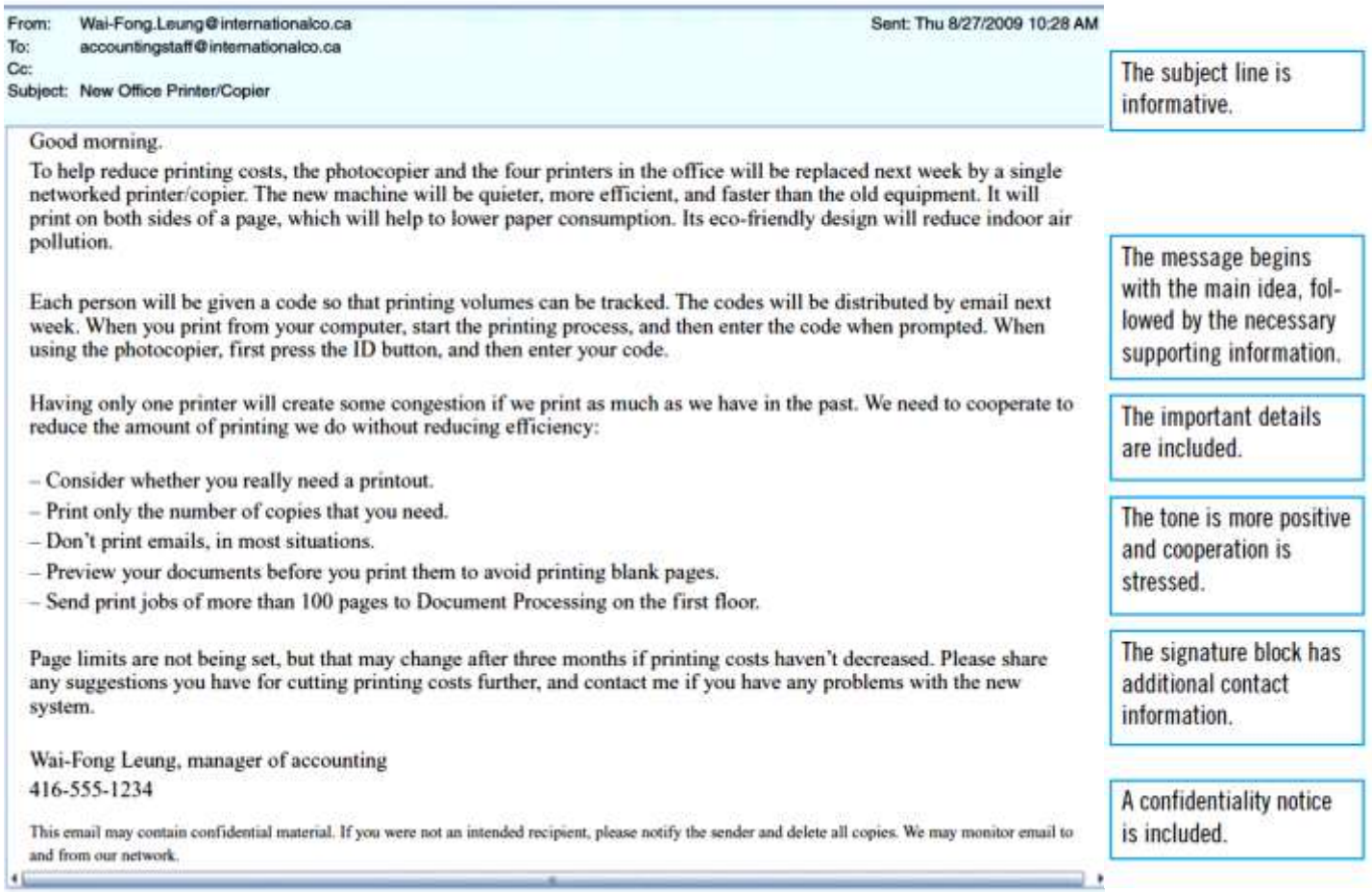
This wasteful practice has to stop. Therefore, I had no choice but to remove all printers and photocopiers from the office and replace them with a single printer/photocopier.

This, of course, means that printing will not be as fast or as convenient as it has been, but the old machines were noisy, inefficient, and a possible cause of indoor air pollution, so I know that everyone will welcome the change. I expect everyone to work toward reducing their thoughtless use of valuable resources by not printing out email messages, finding other ways to reduce paper waste, and sending large orders to Document Processing.

To ensure that this happens, the new printer/copier will require you to enter an individual ID code before printing so that print volumes can be recorded. No further action will be taken with this information right now, but if wasteful printing is not reduced during the next three months, heads will roll.

Routine Communications
Emails

- Email



From: Wai-Fong.Leung@internationalco.ca
To: accountingstaff@internationalco.ca
Cc:
Subject: New Office Printer/Copier
Sent: Thu 8/27/2009 10:28 AM

Good morning.

To help reduce printing costs, the photocopier and the four printers in the office will be replaced next week by a single networked printer/copier. The new machine will be quieter, more efficient, and faster than the old equipment. It will print on both sides of a page, which will help to lower paper consumption. Its eco-friendly design will reduce indoor air pollution.

Each person will be given a code so that printing volumes can be tracked. The codes will be distributed by email next week. When you print from your computer, start the printing process, and then enter the code when prompted. When using the photocopier, first press the ID button, and then enter your code.

Having only one printer will create some congestion if we print as much as we have in the past. We need to cooperate to reduce the amount of printing we do without reducing efficiency:

– Consider whether you really need a printout.
– Print only the number of copies that you need.
– Don't print emails, in most situations.
– Preview your documents before you print them to avoid printing blank pages.
– Send print jobs of more than 100 pages to Document Processing on the first floor.

Page limits are not being set, but that may change after three months if printing costs haven't decreased. Please share any suggestions you have for cutting printing costs further, and contact me if you have any problems with the new system.

Wai-Fong Leung, manager of accounting
416-555-1234

This email may contain confidential material. If you were not an intended recipient, please notify the sender and delete all copies. We may monitor email to and from our network.

Routine Communications
Emails

- Email – Request for Information

City Clerk's Department

Council Building, 510 Main Street

Winnipeg, MB R3B 1B9

To Whom It May Concern:

SUBJECT: Pork Processing Pollution

We, the members of the Two Rivers Taxpayers' Federation, strongly protest the move by Concarné Foods to begin construction of a hog slaughtering plant in the Two Rivers Industrial Park. An industry such as this will do irreparable damage to our businesses, to the neighbourhood surrounding the park, and to the city in general. We will be doing everything in our power to put a stop to this ill-advised proposal.

As such, we demand that you provide us with copies of the Clean Environment Commission's report, a poll that was commissioned on the Concarné hog plant, and information provided by Concarné on its efforts to control odours both at the Two Rivers plant and at its other operations.

We have a legal right to this information under the Access to Information Act, and we will be pursuing legal action if the documents are not forthcoming.

Sincerely,

Bob Knolten

The tone is emotional and demanding.

The request being made is unclear and the language is confrontational.

The closing includes a threat.

Routine Communications
Emails

- Email – Request for Information

City Clerk's Department
Council Building, 510 Main Street
Winnipeg, MB R3B 1B9

SUBJECT: Information request: Concarné Foods' Proposal to build a pork processing plant

Please provide us with information regarding the proposal from Concarné Foods to build a pork processing plant in the Two Rivers Industrial Park. The Two Rivers Taxpayers' Federation is concerned that the plant may have a serious impact on existing businesses.

Specifically, we are requesting the following documents:

- The Clean Environment Commission's environmental assessment of the plant's operations
- The results of a taxpayer-funded poll on the Concarné processing plant
- The report provided by Concarné Foods on the effect that its plants have had on other municipalities and the measures it uses to control odours

The TRTF will be meeting on June 1 to discuss its position on the Concarné proposal. We would appreciate having the documents by May 15 so that we can distribute copies to our members and give them time to study the information.

Sincerely,

Alice Strongpela

President, TRTF

The subject line is specific.

The request is clear and uses neutral language.

The specific documents needed are listed.

A reasonable date for delivery and an explanation are given.

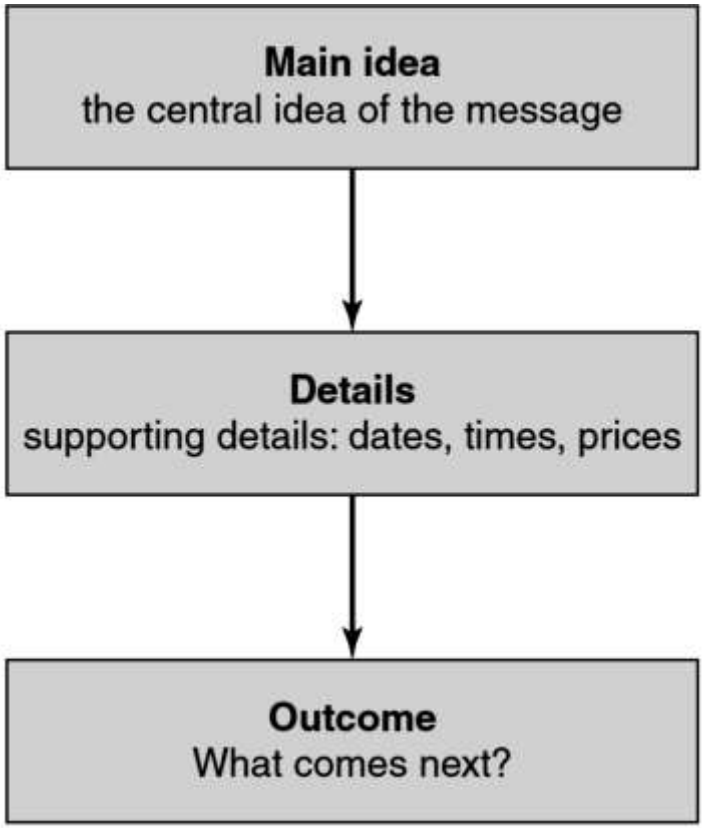
The writer's signature and title are included.

Routine Communication
Major Keys

- Decide what information needs to be included and what should be left out
- Compose subject lines that provide an accurate description of the contents of a message
- Structure routine messages to begin with a key idea followed by necessary supporting details
- Format email messages, letters, and memos to follow standard business conventions
- Write clear, courteous email messages that are sent only to the appropriate readers

Routine Communication

- Flow chart for composing routine messages



Scientific Communication
Emails

- **In-class Exercise**: Writing Effective Emails
  - Compose an email to me
  - Communicate the purpose and provide the important information
  - Send the paragraph you write about your strengths and challenges in writing (from the previous lecture)
  - Adhere to the professionalism of sending an email to a professional colleague

  - Send me the email!

Assignment 1 – Standards of your Field

- Standards of your Field
- Submit *.doc files
- You will be graded on submission of all completed documents by the assigned deadline, and on the quality of your work.

Assignment 1 – Standards of your Field

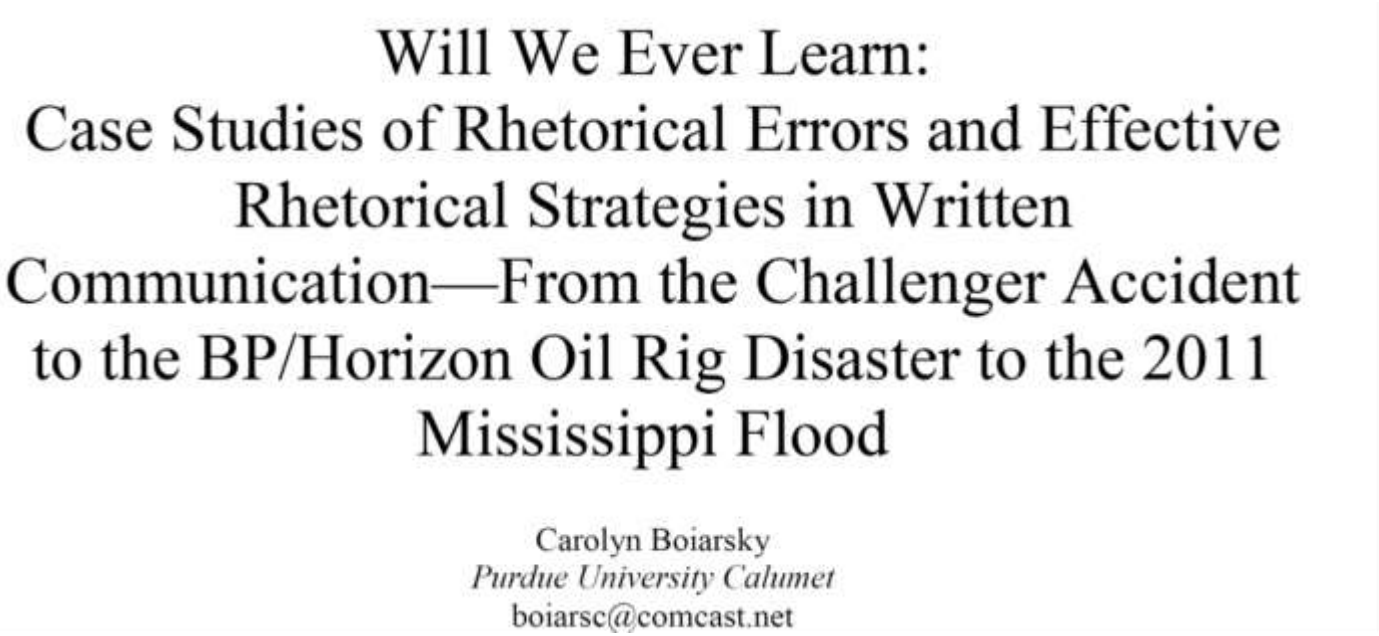
Research is completed only when you communicate your findings on a professional level. The details of the standards for this communication will vary from field to field. In this assignment, you will use your professional network and library resources to get specific information about the publication process in your field. This is information you can use throughout the course and your career. A professor in your field, your research advisor, and a postdoc in your lab would be good resources to help complete this assignment.

a) Is there a published *Style Guide* for publications in your field?
b) If so, what is the name of the Style Guide and how can it be accessed?
c) If not, what resources specific to your field could one turn to for information on the standards of writing in your field?

**** You will use this *Style Guide* for the remainder of the Course****

a) State three journals where your specific research will likely appear?
b) What makes these three specific journals the most highly regarded in your field?
c) Where specifically can one access the *Instructions for Authors* for each of these journals? (Provide the links)
d) Read the *Instructions for Authors* for one of these journals. What specific qualities does the journal seek for its publications?
    I. Scope
    II. Criteria for publication
    III. Submission guidelines (style and format, manuscript organization, references, figures and tables, font, length)
    IV. Publication fees

Week 4 Class (Paper Discussion)



Will We Ever Learn:
Case Studies of Rhetorical Errors and Effective Rhetorical Strategies in Written Communication—From the Challenger Accident to the BP/Horizon Oil Rig Disaster to the 2011 Mississippi Flood

Carolyn Boiarsky
Purdue University Calumet
boiarsc@comcast.net

- Paper available on BlackBoard. Read prior to class!

Paper Discussion
In-Class Exercise (Week 4)

- Each group will lead the discussion for one of the situations described in the paper. Consider the following when preparing:
  - The situation
  - Method of communication used
  - Relationship between the writer and the reader
  - Message that needed to be delivered (as understood by the writer)
  - Message that was delivered (as interpreted by the reader)
  - Failures in the message delivery
  - How this situation would be similar in your field/area of research?