

Introduction to Polymer Science and Engineering

Fall, 2023

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Date	Homework/exam	Date	Homework/exam
8/26 (Mon)		10/18 (Fri)	Read pp.55-56
8/28 (Wed)		10/21 (Mon)	No Class, Fall break Read pp.57-58
8/30(Fri)	Read pp.5-9 Term paper subject explanation	10/23 (Wed)	Term paper due Read pp. 59-60
9/2(Mon)	No Class: Labor Day Read pp.10-14	10/25 (Fri)	Read pp. 61-62
9/4 (Wed)	Term paper title due Read pp.15-19	10/28 (Mon)	Read pp. 64-66
9/6 (Fri)	Drop/Add ends Read pp.20-22	10/30(Wed)	Read pp.67-68
9/9(Mon)	Read pp.23-24	11/1 (Fri)	Read pp.69-70
9/11 (Wed)	Term paper outline and references due Read pp.25-26	11/4 (Mon)	Read pp. 71-72
9/13 (Fri)	Read pp. 27-28	11/6 (Wed)	Read pp.73-74
9/16(Mon)	Read pp.29-30	11/8 (Fri)	Deadline of class withdrawal Read pp.75-77
9/18 (Wed)	Read pp.32-33	11/11 (Mon)	Read pp. 79-81
9/20 (Fri)	Read pp. 34-35	11/13 (Wed)	Read pp. 82-83
9/23(Mon)	Read pp.36-37	11/15 (Fri)	Read pp. 84-85
9/25 (Wed)	Read pp.38-39	11/18 (Mon)	Read pp. 86-87
9/27 (Fri)	Read pp.40-41	11/20 (Wed)	Read pp. 88-90
9/30 (Mon)	Term paper rough draft due Read pp.45-46	11/22 (Fri)	
10/2 (Wed)	Read pp.47-48	11/25 (Mon)	
10/4 (Fri)	Read pp. 49--50	11/27 (Wed)	
10/7 (Mon)	Read pp.51-52	11/29 (Fri)	No Class: Thanksgiving
10/9 (Wed)	Read pp. 53-54	12/2(Mon)	
10/11 (Fri)	Review	12/4 (Wed)	
10/14 (Mon)	Midterm exam	12/6 (Fri)	Last day of class
10/16 (Wed)	Review of the exam	12/17 (Tue)	Final exam (9:00-11:00 AM: Note that the start time is 1 hour later than announced)

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1. No make-up exams will be given

2. Textbook

I have been searching for an appropriate textbook for many years. I have collected the majority of textbooks available on the market and used several of them in the past. Many students thought none of them are appropriate for the class. I, therefore, wrote my own. Several years ago, I modified it to suit the needs of students. While my textbook follows the course schedule, they have limitation in details and the number of subjects covered. The textbook comprises about 40% while the classroom teaching the remaining 60% in terms of contents. The textbook content is sufficient just as the background to understand the classroom lecture, and not the substitute of the classroom contents.

Those of you who feel the need of supplemental materials, more in-depth reading materials, and/or broader coverage of polymer subjects that we cannot cover due to the limitation of time, the following book will give you additional background; however, you should be able to obtain 100 points in the exam without it. *"Mike Coleman and Paul Painter, "Fundamentals of Polymer Science and Engineering." Technomic Publishing, Lancaster, Second Edition."*

3. Term paper

The term paper assignment is an exam (similar to take home exams). Therefore, as is the case for any other exams, my help on specific issues must be limited to assure the fairness to everyone; however, I would be happy to assist you for the general directions on topics and writing styles, and questions about technical issues. **You are required to go to the literature to learn what is the acceptable and respected review articles. Your ability to figure out what is appropriate through the literature search is part of the grading criteria.**

4. Office hours

I have an open-door policy. As long as I am not on the phone or with a prior appointment, I will be with you at the instance when you set your foot at the entrance. You do not need any appointment. In case you have difficulty in finding me, you can send an e-mail to make proper arrangement.

5. Grading policy

Grading will be done considering mid-term exam, term paper, cumulative quizzes, and homeworks. The grading contribution of each item is as follows: mid-term (25%), term paper (25%), final exam (25%), homeworks and cumulative quizzes (10%), and class attendants taken randomly (15%).

6. TA

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How to Become a Great Technical Communicator

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1. How to Write Impressive and Effective Papers

A. Abstract

- ◇ Use present tense.
- ◇ Do not use logic sentences such as "because, since, as, due to....". Do not state historical reasons why the research was done. The abstract should state only what the readers will find in the paper.
- ◇ Do not describe detailed experimental results but do describe the approaches and the methodologies used. Few results in a general manner may be stated.

B. Introduction

- ◇ Describe the significance of the subject or field or state the problems in the past.
- ◇ Describe the history of the subject in the literature.
- ◇ State concisely and clearly the purpose of your study. Use direct expression such as "It is the purpose of this study that..."

C. Experimental (does not apply for a review article)

- ◇ Describe in detail the techniques, materials, procedures, conditions, and instruments used in such a way that a third party can duplicate your results.

D. Results and Discussion

For original research articles

- ◇ Pay attention to consistency of the tense throughout the text. Past tense may be used to describe what was done and observed but present tense is used when describing the universal facts.
- ◇ Do not repeat the experimental conditions in this section unnecessarily. If such is needed, state minimum necessary description.

For review articles

- ◇ Decide first if you want to review the subject in horizontal or vertical placement approach.

Horizontal approach: if you want to describe multiple items on a equal basis. There is little relationship among those key subjects other than the fact that those are under the same article subject.

Vertical approach: You discuss one or few subject in its entirety, including historical development, modern problems, justification of the field, sample synthesis and preparation, property characterization, application, and future visions.

E. Conclusions

- ◇ Do not repeat the same sentence as used in the results section. Summarize them.
- ◇ Do not use logical sentences. Logical discussions should have been done in the discussion section.
- ◇ Length should be half a page or at most one page.

F. References

◇ *Books in general*

H. Ishida, "How to Work Patiently under a Japanese Boss," Academic Press, New York (1993).

If a specific page needs to be cited, then:

H. Ishida, "How to Work Patiently under a Japanese Boss," Academic Press, New York (1993) pp. 777-876.

◇ *Articles in edited books*

A. Michaelson in "Case Western Reserve University: The Center of the Universe," A. Einstein, Ed., Oxford Press, London (1905) p.248. (or pp.248-269)

◇ *Articles in journals*

Traditional style:

H.W. Mark and S.F. Rogers, "title: some journal or proposal require the title for the journal article," *J. Polym. Sci. Phys. Ed.*, **34**, 246 (1973).

American Chemical Society style:

Mark, H.W.; Rogers, S.F., title: some journal or proposal require the title for the journal article. *J. Polym. Sci. Phys. Ed.* **1973**, *34*, 246-267.

- issue numbers are not necessary unless it is the only way to describe the precise location of the article.
- DOI number may or may not be required depending on the journal policy.

◇ *Abbreviations of frequently used journals*

J. Polym. Sci. Phys. Ed.	Journal of Polymer Science, Physics Edition
J. Polym. Sci. Chem. Ed.	Journal of Polymer Science, Chemistry Edition
Macromolecules	Macromolecules
J. Colloid Interface Sci.	Journal of Colloid and Interface Science
Makromol. Chem.	Die Makromolecular Chemie
Polymer	Polymer
J. Macromol. Sci. -Phys. Ed.	Journal of Macromolecular Science, Physics Edition
J. Am. Chem. Soc.	The Journal of the American Chemical Society
Polym. Compos.	Polymer Composites
J. Appl. Polym. Sci.	Journal of the Applied Polymer Science
Appl. Spectrosc.	Applied Spectroscopy
J. Adhesion	Journal of Adhesion
Polym. Eng. Sci.	Polymer Engineering and Science
Spectrochim. Acta	Spectrochimica Acta
J. Mater. Sci.	Journal of Materials Science
Eur. Polym. J.	European Polymer Journal
ACS Sustain. Chem. Eng.	ACS Sustainable Chemistry & Engineering
Macromolecules	Macromolecules
React. Funct. Polym.	Reactive and Functional Polymers
Polym. Degrad. Stabil.	Polymer Degradation & Stability

Hints for Oral Presentation

Hatsuo Ishida

1. Attitude--

- Face to the audience, explain to people, talk in a natural way.
- Identify a person and try to explain to that person. In this way, you may release the pressure of facing a big audience.
- Notice the audience's response when you make each statement.
- Knowing how to communicate with the audience is the most important thing.
- Speak in a positive way, with full confidence. Say "We developed ...which is a great advantage ...," don't say "There is a problem ..."
- Start to answer the question only after you fully understand it, at least let people finish it.

2. Preparation--

- Look at each slide and think "What and how do I want to say about this slide?"
- You should know the explanations and the emphasis of each slide. So, as the change happens in terms of topic, speech length, and the audience background, we can still make the story.
- Give clear purpose of each slide.
- Put heading on each slide. When it appears, just by the heading, people can understand what you want to say.
- Go to the point directly for each slide, don't go to any minor details which would divide the audience's attention.
- Indicate the exact item by the pointer. Do not move around unless you want to show an area.

3. Check the lecture hall in advance, and try to get used to that space. Stand at the podium to look toward the audience, if possible.

4. Practice as much as you can. Use tape to record your speech, listen and check the weak points. Try to prepare good presentation materials to cover the presentation skill.

5. Use symbols to categorize different emphasis (majors and minors). Prepare intuitive slides rather than the one the audience needs to use logical sequence to understand it.

- ☐.....
- ☐.....
- ☐.....
- ☐.....
- ☐.....

6. How many slides should I prepare?

Use the Ishida Equation: for Presentation $Number\ of\ slides = 0.9 \times number\ of\ minutes\ allowed$

Hints for Defense

1. Relax, don't be nervous. Be confident. In that narrow field no one can surpass you.
2. It is supposed to be concise, efficient.
 - Don't try to display your knowledge which are done in the thesis.
 - It is contrary to conference presentations. You can start from the top of the pyramid.
 - Just show the highlights of the thesis in 20-25 min.
 - Don't talk too much details, only do so to answer questions.
3. Emphasize the things by thinking of --
 - What is unique in your research?
 - What did you do, get, and explain it.
 - What are your main achievements?