進階化學論文寫作 （114 學年度 第二學期）
Advanced Technical Writing for Chemical Sciences (Spring 2026)

https://cool.ntu.edu.tw/courses/37426

Instructor: Chang-Ming Jiang (A322 Chemistry, cmjiang@ntu.edu.tw, 02-3366-1167)

Schedule: Wednesdays 15:30 – 18:20
Classroom: A217 Chemistry

Intended Audience: Graduate students in the Chemistry Ph.D. & M.S. programs

Required Textbooks and Teaching Materials:

- J. Dunphy, *MIT 21G.225 Workbook.* (available on NTU COOL)
- Diana Hacker & Nancy Sommers, *A Writer's Reference*. 8th ed., Bedford/St. Martin's.
- Chris A. Mack, *How to Write a Good Scientific Paper*, SPIE Press (Open Access: https://doi.org/10.1117/3.2317707)
- A research paper by top researchers in your field published in *J. Am. Chem. Soc.*, *Angew. Chem. Int. Ed.*, or *Chem. Sci.*. This article will be your **model paper** and will be used in class throughout the semester. It is important to choose a model paper that is **well-written** and **lucidly presented**.
- Online English-English dictionary (e.g., American Heritage or Oxford American)
- Notebook/blank A4 paper in every class.
- An A4 binder that holds handouts, assignments, and quiz papers.
- **Handouts** will be uploaded to NTU Cool **for each lecture** in the previous week. Please download and have it available for each lecture (either on paper or on your electronic device is fine).

Recommended Reading Materials:

- *The Mayfield Handbook of Technical Scientific Writing*. http://www.mit.edu/course/21/21.guide/toc.htm
- Day, Robert A., and Barbara Gastel. *How to Write and Publish a Scientific Paper*. 7th ed. Greenwood, 2011. ISBN: 9780313391972.

Course Description:

Technical English writing and the preparation of high-quality, professional scientific figures and tables are essential communication skills for graduate students across academic and industrial settings. This course aims to provide Chemistry-majored graduate students a systematic framework for effective technical writing, as well as guidelines and hands-on experiences in composing documents useful for their future careers. Specifically, students will learn the intricacies of writing technical notes, e-mails, letters, resumes, research proposals, and research papers. The course content gradually moves from simple sentence constructions to complex paper drafting and editing, with each lecture and assignment building on the ones before. In addition, this course emphasizes group discussions and hands-on practice both in and out of class, and the completed assignments will often be reviewed by other class members. Therefore, regular attendance, timely completion of assignments, and active participation throughout the semester are required for all students enrolled in this class. A majority of the course content follows that of MIT 21G.225/226, developed by J. Dunphy, and was previously taught by Prof. Yuan-Chung Cheng in NTU Chemistry.

What do we do in this course?

- **Handouts** and **video** recordings of each lecture will be uploaded to NTU COOL a week before the class, and students **must read and watch** these materials before each class. Pre-class preparation will be extremely important to the success of this course, and I encourage students to do it with a study group of peers.
- Watch the lecture video before each lecture. We will not repeat what's in the video in class.
- Each class will have ~ 0.5 hr lecture/Q&A + ~ 1.5 hr hands-on writing/editing/discussion.
- An **assignment** will be given each week. Students **must** complete the items in the assignment on time.
- A quiz will be given in class or as an exercise after the class to review various English-language issues. Answers will be provided on NTU COOL after each class.
- Groups of ~ 3 students will be formed in each class. Teamwork and peer-review will be used extensively in our hands-on sessions.
- The overall coursework includes 3 exercises, 3 emails, one infographic, and 3 short articles:
  - Exercises: summary, words and sentence patterns, sentence/paragraph revision
  - E-mails: request for experimental materials, progress report (memo), explain research results (with a table or a figure)
  - Infographics: showcase an interesting chemical phenomenon/principle
  - Short articles: Summarizing a paper, cover letter or resume, introduction section of a research paper

  These assignments should be submitted to NTU COOL before each class. Turn in your assignment in a single PDF file each week. Late assignment papers will not be accepted. You will fail to receive credit for this course if you do not hand in enough homework papers.

Grading:

The letter grade will be based on all coursework results. In addition, punctuality, attendance, pre-class preparation, active contributions to discussions, and on-time completion of assignments will also contribute to the grades.

- Exercises: 10%
- E-mails: 10%
- Infographics: 30%
- Short articles: 40%
- Other class performances: 10%

Tentative Course Schedule

Week #	Date	Topics	Remarks
1	2/25	Introduction to the course/How to read a research paper; Tip: ESL trouble spots; Workshop: Analyzing a short article	
2	3/4	Effective writing process and strategies/ Technical writing style/Effective sentences; Tip: Word choice; Workshop: Effective peer review	Exercise #1 due
3	3/11	Effective paragraphs/Coherence; Tip: Transition signals; Workshop: Micro revision	Exercise #2 due (Practice part of Exercise #3 in class)
4	3/18	Reading & writing arguments; Tip: Preposition; Workshop: Model article analysis; Workshop: Paragraph revision	Exercise #3 due
5	3/25	No class	CMJ traveling
6	4/1	Looking for the right word: Introduction to 10 online dictionaries/Citation and paraphrasing; Workshop: Chemistry article analysis	Assignment #4
7	4/8	Introduction to infographics/Image copyright and image search; Workshop: Infographics in public science	Short Article #1 due (paper summary)
8	4/15	Reference formats/Electronic reference manager & online database; Workshop: Styles of Scientific Infographics	Preparation of the infographic homework
9	4/22	Writing emails to scientific colleagues/ Memos/Correspondences Workshop: Inforgraphic editing	Infographic homework due (draft)
10	4/29	Resume and Cover letter/Technical writing in the age of AI; Workshop: Experimenting with ChatGPT/ Midjourney	Email homework #1 & #2 due
11	5/6	No class	CMJ traveling
12	5/13	**Infographic Presentation**	
13	5/20	Writing up research (1): Composition of scientific papers, figures, tables, equations, chemical scheme… Tip: Tables and figures in Chemical papers; Workshop: Table and figure captions	Infographic homework due (final version)
14	5/27	Writing up research (2): structure of scientific papers, abstract, introductory sections, proposals Workshop: Writing commentary/argument & Proposal editing	Email homework #3 due Short Article #2 (resume)
15	6/3	Writing up research (3): Methods, results & discussions, conclusions; Workshop: Draft paper editing	Short Article #3 due (Introduction, draft)
16	6/10	Writing up research (4): Final draft revision, Publishing & professionalism; Workshop: Paper Introduction peer review	
17	6/17	No class	Short Article #3 due (Introduction, final version)

Last updated: 2026/1/16