Technical and Scientific Communication is the study of written, oral and visual communication in professional settings. It emphasizes the role of diverse audiences, writing processes and research, genres, visual communication, collaboration, professional responsibility, and clear expression.

HU 3120 Technical Communication is a three-credit course designed for enhancing critical thinking for undergraduates in engineering, science and technology. The focus of this course is on providing students with the theory and practice in professional communication skills essential for their technical careers. Because course participants are pursuing degrees in diverse technical and scientific areas, they have the unique opportunity to consider the challenge of communicating effectively with a multidisciplinary audience. Developing professional flexibility and creating documents, visuals, and presentations shaped by the expectations of a diverse audience clearly prepares students for a future of negotiating with managers, technical employees, marketing and legal departments, clients and users of technology.

Upon successful completion of HU 3120, students will have learned:

- how to evaluate the rhetorical situation for each technical writing or speaking task
- how to plan, write, edit and present technical information, individually and collaboratively, in a timely and professional manner
- how to use and recognize moral theories and codes to deal with workplace conflicts in engineering ethics
- how to respond to a Request for Proposals
- how to identify, retrieve and critically analyze technical information through library research, computer databases, and online networks
- how to present—orally and visually—research findings with clarity, confidence, professional control for an interdisciplinary audience of peers
- how to organize a lengthy technical report in order to meet the expectations of particular audiences in a variety of contexts
- how to edit written work for unity, for coherence, and for textual and linguistic competence (grammar, punctuation, effective sentences and transitions)

Required materials:
- Online or reserve readings that I assign.
- A flash drive or other means for saving backup copies for all your documents as well as for visuals, videos, and so on for presentations.

Recommendations:
- Be prepared to pay for research articles, for printing a few assigned articles sent to you in email, and for printing drafts of your work for peers to review. Often students print anywhere from 150 to 200 pages in this course alone. Print all documents double sided.
- Work with writing coaches in The Writing Center to test out your work on an "outside" audience, to work on organization, and to improve the clarity of your writing.
• assignments
  career materials (50)
    resume and letter drafts
    revised resume
    cover letter
    points 9/15 9/22 9/22

  major technical report (700)
    concept memo
    proposal draft, including technical definition/description
    proposal
    status report memos (2)
    formal report presentation
    preliminary draft of technical report
    revised, edited major technical report
    points 10/01 10/15 10/22 10/25 10/27, 11/19 last 2 weeks

  team ethics case study
    points 12/14

  in-class critiques, reading/editing quizzes,
  final reflection memo
    points varies

• letter grades for course
  A  935-1000 points  C  665-724 points
  AB 865-934 points  CD  595-664 points
  B  795-864 points  D  540-594 points
  BC 725-794 points  F  under 540 points

• cautions
  Students must complete all assignments in order to pass the course.
  Students cannot pass the course with more than four absences.
  Students cannot submit work for extra credit.

social practices/responsibilities defined

Timeliness, courteous response to others’ ideas and work, preparedness, and workplace quality communication products characterize conduct in the professional workplace and in this course. In this course you are expected to conduct yourself as a respectful and dependable colleague.

• At the beginning of each class, please check your belts, pockets, and backpacks for electronic devices to be sure they are turned off. Respecting this policy will make it easier for all of us to communicate and focus in the classroom. Again, NO live cell phones are permitted in this class—neither are Blackberries, pagers, iPods, TVs, PSPs, laptops, head phones, or any other electronics you may possess. When it is necessary for you to use a computer, we will have access to the Humanities computer lab.

• Email communication will be frequent in this course, so be sure to check your mail at least once a day. Please be sure that you have activated your MTU email and that you have forwarded your email accordingly if you do not use your @mtu.edu address as your primary email. Also, if you are using another email service as your primary address, please check that you have enough space to receive several course messages. You are responsible for the information contained in messages that bounce back due to lack of space. Please sign all emails to me with your full name, not your username.

attendance

Frequently, students will be discussing each other’s work and providing written reviews of each other’s writing and presentations during this class. For these reasons, infrequent or erratic attendance is disruptive to learning and will have negative consequences. Students who miss more than four classes cannot pass the course.
late work

Your colleagues and I expect you to turn in your best work by the deadline. Not having an assignment completed by class time will definitely affect your ability to participate in class and will create difficulties for your colleagues as well. Because our work lives are busy and sometimes interrupted by unavoidable circumstances, however, one major assignment can be submitted without penalty if you email me by midnight the night before deadline.

- You may choose one major writing assignment other than the final technical report due at the end of the semester to submit two class days after the original deadline. Think carefully about your scheduled midterms, other projects, and work schedule as you plan which assignment to use as your approved late one.
- No other late written assignments are accepted for full credit; timeliness in the workplace is highly valued. I will accept a late assignment up to 48 hours after deadline, but credit for the assignment will not exceed a "C," regardless of quality of the work.
- Failing to give an oral presentation on the scheduled day results in an "F" or zero for the assignment. No exceptions.
- Failing to attend a scheduled conference with the instructor counts as two absences because class meetings have to be cancelled in order to set aside time to meet with everyone in the class.

students with disabilities

Students who qualify for accommodations such as an interpreter, a note taker, or course materials in different formats can contact Dr. Gloria Melton in Student Affairs. She will evaluate your request and present options for you to design a learning plan for approaching assignments in this course.

discrimination/harassment policy at MTU

The MTU is committed to creating a dynamic, diverse and welcoming learning environment for all students and has a non-discrimination policy that reflects this philosophy. Disrespectful behaviors or comments addressed towards any group or individual, regardless of race/ethnicity, sexuality, gender, religion, ability, or any other difference is deemed unacceptable in this class, and will be addressed publicly by the professor.

academic integrity

All work—writing, data, and visuals—that you take from a print or online source must be carefully quoted, paraphrased, and cited in your papers and presentations. Anything less than full documentation is considered plagiarism and will result in the student failing the course.
**CALENDAR**

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**week one**  
**tues (9/1/09)**  
intro to course, each other, major technical project  
bring rough draft/old resume  
skim Woolever Chapter 18 before class

**thur (9/3/09)**  

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**week two**  
**tues (9/8/09)**  
Woolever: read Chapter 5  
In-class work on job letters  
bring job ad and draft of new resume  
in-class exercises on lists and parallel structure  
handout distributed on design principles

**thur (9/10/09)**  
intro to document design principles  
read Woolever read Chapter 4  
in-class resume exercise in pairs  
expect quiz on lists, parallelism, “CRAP” principles

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**week three**  
**tues (9/15/09)**  
submit rough draft of resume and job letter at required conferences in pairs

**thur (9/17/09)**  
submit rough draft of resume and job letter at required conferences in pairs

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**week four**  
**tues (9/22/09)**  
bring resume and job letter file to class on jump drive for final, in-class editing  
submit final, revised resume and job letter at end of class

**thur (9/24/09)**  
intro to topics and purposes for major technical report  
Woolever: read Chapter 13 on formal reports  
bring your 3 topic choices to class (in writing) and be prepared to discuss your choices with the class  
Sign up for individual proposal conference with me

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**week five**  
**tues (9/29/09)**  
Library workshop on patent searches (meet in Library)

**wed (9/30/09)**

**thur (10/1/09)**

**thur (10/3/09)**

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**week six**  
**tues (10/6/09)**  
submit edited concept memo  
Woolever: read Chapter 14  
Keep working on research for major technical report proposal

**thur (10/8/09)**  
Woolever: read Chapter 11 on technical definitions, descriptions and summaries  
Keep working on major technical report proposal (including technical description in appropriate section)

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**week seven**  
**tues (10/13/09)**  
bring rough technical report proposal to class for peer review exercise

**thur (10/15/09)**  
final in-class editing for proposals, using Checklist  
work on adding international elements to individual technical style guides
week eight
tues (10/20/09)
Woolever read Chapter 5
Submit (email) proposal drafts by end of day (midnight is OK)

Woolever: read Chapter 7 (globalization vs. localization)
read article by Thrush and be prepared to discuss how it might apply to your major technical report
intro to international issues in graphics;

thur (10/22/09)
submit final proposals (use individual style guide)
view Helvetica video
keep working on research for major technical report

week nine
tues (10/27/09)
Woolever: read Chapter 6
intro to ethics committee project and successful committee work
final technical report structures
Email me your first status report memo for major technical report before class

thur (10/29/09)
more on final technical report structures
first ethics committee in-class meeting
submit ethics memo #1 via email by end of class
keep working on writing major technical report

week ten
tues (11/3/09)
Woolever: read chapter 8
brief review of integrating and documenting technical information sources
second ethics committee meeting
keep working on writing major technical report

thur (11/5/09)
third ethics committee meeting in computer lab

week eleven
tues (11/10/09)
ethics case study presentations & print copy of ethics memo #2 (case summary) due for 4 committees
keep working on writing major technical report

thur (11/12/09)
ethics case study presentations & print copy of ethics memo #2 (case summary) due for 4 committees
keep working on writing major technical report

week twelve
tues (11/17/09)
submit print copy of ethics memo #3 (responses)
keep working on writing major technical report
read both assigned websites on PowerPoint controversies
graphics in presentations and report

thur (11/19/09)
email status report #2; bring draft of major technical report for peer review exercise
keep working on writing major technical report

thanksgiving recess

week thirteen
tues (11/31/09)
Come back safely!
presentations of major technical report
HU 3120 - Choosing a topic for your technical report

When choosing your topic, keep in mind the following criteria. Your topic should be
- Engineering (or your field) related
- A research question to which you don’t already know the answer
- Do-able within the semester
- Narrow enough so that your report shows depth and detail
- Not purely informative, but evaluative and analytical
- A subject that has credible literature written on it for your research purposes

The following topic categories and specific topics are meant to stimulate your own idea for a topic choice. If you decide you want to do something similar to what is on this handout, then make sure that you put your own original spin on the idea.

Category 1: Evaluation of engineering designs
In this category, you would evaluate engineering solutions to a design problem. Such problems might range from the design of a casting (foundry) process to the design of a tool or piece of equipment or the methods of detecting carbon monoxide in the home. You could start out by saying, "Here is a problem that needs to be solved, and I want to find a way to do it." Or you might want to analyze the most promising design solutions already on the market. If you decide to analyze designs, be sure to have at least two possibilities to compare, as well as three or four criteria for comparing them.

Sample ideas in this category:
- Assessment of earthquake resistant concrete structures
- Feasibility of using alternative energy technologies for military ground vehicles
- 2005 Formula SAE power train cooling system optimization (compared 2004 to 2005 PTCS)
- An evaluation of the hemolytic contribution of the axial flow blood pump
- Feasibility and benefits of decentralized customer service
- Comparison of the fluid dynamics of competing styles of racing sailboat hulls
- Comparison of methods for detecting plastic explosives in airplane luggage
- Analysis of microprocessor heat removal technologies
- Study of methods for recovering energy at coal-burning plants

Category 2: Safety or environmental assessments of technology
In this category, you may assess the safety or environmental impact of any technology.

Sample ideas in this category:
- Problems associated with powering up Tokyo's cracked reactors
- Do soft paper mills present compromising environments for employee health?
- Risks associated with artificial hips, knees, heart valves, or any new biomedical engineering designs
- Evaluation of the efficacy and safety of a specific alternative therapy or medicine
- Methods of mitigating water (or soil) pollution from a coal mine
- Methods of mitigating cryptosporidium contamination in surface water
- Does the Army have adequate and safe plans for disposing of its chemical weapons stockpile?
- Methods of detecting air pollution and its sources
- Controversies arising from the Food and Drug Administration's funding and testing practices

Category 3: Analyzing natural disasters
In this category, you would collect and evaluate the validity of research done on some aspect of a natural disaster such as a tsunami, hurricane, earthquake, volcanic eruption, tornado, avalanche, or mudslide. You might evaluate such aspects as prediction methods, prevention methods, or preparation techniques.

Sample ideas in this category:
- Assessing precursor monitoring as a prediction method for earthquakes, avalanches, or mudslides
- Assessing eruption cycles as a prediction method for further volcanic eruptions
- Evaluating the methods used to control floods of the Mississippi River (or other areas, of course)
- Assessing techniques to measure wind speeds within tornadoes
- Evaluating emerging designs and theories about controlling widespread forest fires

Category 4: Assessment of engineering failures
In this category, you examine a past engineering failure, such as the Mars Polar Lander. You could evaluate different theories about what caused the failure and how the failure affected future engineering designs.

Sample ideas in this category:
- Examine the causes and effects of the Carlsbad, NM, underground natural gas explosion of August 2000
- Failure of the New Orleans's levees during Hurricane Katrina in 2005.
- What management, testing, supply, communication, and/or delivery problems caused 2004's flu vaccine shortage?

AVOID the following overused topics: Comparison of steel-reinforced concrete to fiber-reinforced concrete in transportation applications; Examination of RFID's potential security issues/uses; Analysis of the future of manned space exploration vehicles; Comparison of hybrid vehicles; Analysis of feasibility of roundabouts to decrease traffic problems.

A note on industrial and systems engineering topics: When considering topics dealing with Six Sigma, Lean manufacturing, QRM, or other broadly defined tools for improving efficiency and quality within manufacturing systems, be aware that you will be required to not just discuss the theoretical differences or strengths of these systems, but to also apply them in a practical way to a case/site where their effects can be measured or analyzed. While you may pull some reference information from published case studies, you will be required to apply these tools in some way in order to come to conclusions about their use and value.

A note about patents: Be incredibly careful if your project involves a patent—your own, your professor's, your employer's or former employer's. You do not want to give away anyone else's intellectual property or interfere with their patent or intentions to patent.