INTEGRATING TECHNICAL COMMUNICATION INTO A MATHEMATICAL MODELING COURSE

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WHY INTEGRATE TECHNICAL COMMUNICATION INTO MATH MODELING COURSES?

• Non-technical skills stressed by Industry Advisory Board
  • Communicating technical and non-technical info to technical and non-technical audiences
  • Making effective PowerPoint presentations
  • Managing projects
  • Working effectively in teams
• The above skills are integral for most math modeling endeavors
WHY CO-TEACHING?

- As math faculty, we value strong technical communication skills but have no formal training in teaching or assessing these skills in our courses.
MATH 430 ADVANCED MATHEMATICAL MODELING

- Taken by students pursuing Mathematics BA or Industrial & Applied Mathematics BS
- Project-based
  - Project 1: smaller, completed independently
  - Project 2: significantly larger, more complex, completed in teams
OVERVIEW OF TECHNICAL COMMUNICATION IN MATH 430

• Part 1 (weeks 1-5)
  • Project 1: Optimizing Franchise Expansion
  • Key concepts in technical communication
  • Development of writing skills and visual communication skills

• Part 2 (weeks 6-10)
  • Project 2: Investigating queues at a local cafe
  • Development of teamwork skills

• Part 3 (weeks 11-15)
  • Project 2
  • Development of team writing skills
  • Development of oral presentation skills
PART 1: COMMUNICATING TC IN WRITING AND VISUALS

• Project 1 modeling and analysis

• Key concepts in technical communication:
  • Audience
  • Purpose

• Development of writing skills:
  • Peer review
  • Writing effective prose
  • Genres: Project 1 technical report and executive summary

• Development of visual communication skills:
  • Document design
  • Reader-centered graphics
PART 2: PROBLEM SOLVING IN TEAMS

• Project 2 modeling and analysis
• Development of teamwork skills:
  • Collaboration
  • Project management
  • Revising in teams
  • Communication styles in teams
  • Troubleshooting team problems
PART 3: TEAM WRITING AND PRESENTATION

- Project 2 communication of findings
- Development of team writing skills:
  - Project 2 Code/spreadsheets accuracy check and final draft
  - Project 2 Technical report rough draft and final draft
  - Project 2 Executive summary rough draft and final draft
- Development of oral presentation skills:
  - Creating presentations for a specific audience and purpose
  - Designing effective slides
ASSESSMENT OF TECHNICAL COMMUNICATION SKILLS

• The same grading rubric for both instructors
• Sample grading criteria categories:
  • Rhetorical awareness
  • Content
  • Design
  • Prose
LESSONS LEARNED FROM CO-TEACHING

• Rikki (math faculty member):
  • Instructional methods and pedagogy used in technical communication
  • Effective use of peer review
  • Assessment methods for technical communication skills

• Olga (technical communication faculty member):
  • Working with math students
  • Working with a small class
THANK YOU!

Feel free to contact us if you have follow-up questions.

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