My views and Advice on TEACHING, RESEARCH, AND PROFESSIONAL SERVICE

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*** DISCLAIMER ***

What I say here only reflects my personal views on teaching, research, and professional service aspects of being a faculty member. I will be speaking on these topics from my own experience as a university faculty member for about 35 years. What I say neither represents necessarily the views of the university, department head, or the T&P committee. Also, your attendance at this meeting is optional but the participation may help you professionally.
THE BIG PICTURE

We must manage our time in such a way that we balance our life by taking care of our obligations to family, profession, and society.
TOPICS TO BE DISCUSSED

• Teaching/Education
• Research (publishing and sponsorship)
• Professional Service
TEACHING

- Be interested in (and passionate about) students’ learning the material
- Prepare your lectures – every lecture and every time you teach
- Relate to common-sense thinking and to material covered in courses already taken by the students
- Be open and fair in your evaluations
- Allow sufficient time for questions and office visits
TEACHING (continued)

- Handout in the first class should provide the objective of the course and information on the textbook used, material to be covered, homework to be assigned, tests and quizzes to be given, grading policy, and office hours. It is not a good idea to change these in the middle of the course.
- Discourage and avoid giving make-ups.
- Giving too much help may earn high evaluations but it is not effective teaching.
RESEARCH

Scholarship “The systematized knowledge of a learned person, exhibiting accuracy, critical ability, and thoroughness”

- Keep the long-term objectives in mind
- Focus in specific area that is not saturated – so that you can become a leader in the area.
- Conduct research to publish and seek sponsorship/funding
- Organize your time around teaching to do research – not postpone it
PUBLICATIONS

• All engineers must present their work to others:
  • Superiors
  • Peers
  • Public
• Engineers are results-oriented people, and reports/papers are how results are communicated
• Some reports are formal and most are informal; but journal papers are all formal
JOURNAL PAPERS AND BOOKS

- Journal publications are very important
- Publish in journals with good standing.
- Review articles are cited more often
- Conference papers should be expanded and published as soon as they are presented
- Books take lots of time and require certain level of professional maturity
EFFECTIVE TECHNICAL WRITING

• EFFECTIVE WRITING IS:
  • Choice of words
  • Artful combination of words
  • Straightforward, unambiguous phrasing
  • Non-distracting phrasing
  • Above all - communication of ideas

• We want to discover the art of writing and obey the rules of grammar
CHARACTERISTICS OF GOOD WRITING

• Clarity - be readily understood
• Conciseness - don’t waste words
• Effectiveness - be efficiently understood
• Preciseness - state without ambiguity
PROBLEMS IN WRITING

• Distracting/Frustrating the reader:
  • Grammar mistakes and spelling errors
  • Awkward sentence construction
  • Technical errors and omission of data

• Not saying what you mean:
  • Use of ambiguous words
  • Indefinite references

• Confusing the reader by:
  • Poor organization
TITLE and ABSTRACT

• Tickler (get attention to a topic)

• Concept (statement)

• Findings (right and wrong)
ORGANIZATION: General Comments

• Create a plan for the paper
• What should be covered and what should be eliminated?
• What level of detail? Consider space available
• Submit all resource material to the why test
• Develop an outline
• Fill in the outline
• Use clear figures to aid your explanations
ORGANIZATION: Outline

• **Introduction**
  - Sell your readers on your work - motivation
  - State your idea directly or indirectly with examples or quote statistics

• **Body**
  - Explain in sufficient detail to accomplish objectives
  - Illustrations, examples, equations, statistics

• **Conclusions**
  - Review purpose of paper or report
  - Summarize and stress main ideas
SIMPLEST OUTLINE

• Tell them what you’re going to tell them
• Tell them
• Tell them what you told them
ESSENTIAL ELEMENTS OF A PAPER

- Abstract
- Introduction
  - Literature review
  - History of the problem
  - Clear problem statement
  - Road map of the document
- Analysis and/or experiments
- Comparison of analysis and experiments
- Discussion of results
- Suggestions for future work
- Conclusions
- References
- Appendices
ORDER OF READING REPORTS BY BUSY PEOPLE

1. Conclusions
2. Introduction
3. Body
   • Some readers have time only for the highlights
   • Don’t presume readers will take time to read all your work
   • Conclusions must stand alone
   • The body is read only if the conclusions and introduction sufficiently intrigue the busy reader
ABSTRACT

• Brief (100-200 words) statement of essential points
  • What is the problem?
  • How is it attacked?
  • Significant results and conclusions

• An abstract does not include:
  • References, Figures, Equations (except in sentences)
    (must be just words for abstracting services)

• People make a decision to get or not to get a paper based on just the title and the abstract
INTRODUCTION

• Motivate study of an area or problem
• Give the pertinent background on the problem
• Define basic terminology
• Define the problem
• State the objectives
• Outline what you’ll do to accomplish the objectives in the various sections of the paper, report, or presentation (road map of the report)
BODY OF THE PAPER

- All paragraphs must have
  - topic sentence
    state the main point of the paragraph
    in the lead sentence
  - body
    develop the theme of the topic sentence
  - transition to next paragraph
    the last sentence is the essential
    transition to the next paragraph
- No one-sentence paragraphs
  - if that’s all you have to say, forget it
  - or, put it in an adjoining paragraph
SUMMARY

• Be creative
• Always keep the reader in mind
  • ease of understanding
  • directness of approach
• Don’t be afraid to consult a grammar handbook
• Above all, communicate!
CONCLUSIONS on Technical Writing

- Don’t just stop!
- Remember to tell them what you told them
- Summarize your main points
- Suggest practical applications
- Suggest future work
- Do all this here because some read only the introduction and conclusions
EASILY READ WRITING GUIDES

American academic culture is such that faculty members are required to seek research sponsorship to support their students and themselves (e.g., summer salary, equipment, and travel)
PROPOSAL WRITING

➢ What is it that you are proposing to do?
➢ Why is it important to do?
➢ How and Why - How does your proposal work differ from reported (or existing) work, and why is yours worthy of support?
PROPOSAL WRITING (continued)

• Read and follow the requirements of a proposal (e.g., number of pages, dollar amounts, cost-sharing, etc.)

• Preliminary contact with funding Agencies (to know other factors that are considered in evaluating the proposals)

• Never ‘over-do-it’ to turn the reviewer off

• Keep things in perspective (teaching and student advising, personal involvement in research, professional goals and objectives)
THINGS REVIEWERS LOOK FOR IN A PROPOSAL

• Proposed Research
  – Originality
  – Clarity
• Motivation for the Proposed Research
  – Background
  – Summary of the state-of-the-art
  – Paragraph leading to the proposed research
• Technical Know-how
  – Why it should be done
  – What is special about your proposed work
  – Preliminary results
  – Significance and impact
• GENERAL COMMENTS
  – NSF Career award proposals
  – NSF regular proposals
  – Other Organizations

• THINGS REVIEWERS LOOK FOR
  – What is proposed
  – What is new about the approach
  – Why your approach is better
  – Preliminary work
  – Demonstration of technical knowledge
  – Significance

• SOME SUGGESTIONS/ADVICE
  – Requirements of the proposal
  – Preliminary contact/preproposals
  – ASEE/DoD/DoE Fellowships
  – Other than NSF
FUNDING AGENCIES

• Peer-Review Agencies
  – National Science Foundation (NSF)
  – Army Research Office (ARO)

• Monitor (or in-house) Review Agencies
  – Air Force Office of Scientific Research (AFOSR)
  – Office of Naval Research (ONR)
  – National Aeronautics & Space Administration (NASA)
  – Industrial & Research Organizations
PROFESSIONAL SERVICE

- Review of journal manuscripts
- Proposal reviews or serving on panels
- Serve on Professional/Technical Committees (State/National/Int.)
- Organize sessions, symposia, and conferences
- Memberships on editorial boards of journals in your areas of expertise.
- Help local schools with your technical background
CLOSING COMMENTS

• Manage your time between different responsibilities in life (family, job, and profession).

• Be passionate about teaching and research and devote sufficient time to them. Say ‘no’ to certain professional service requests when your plate is full. Do not always think of ‘what is in for me’.

• ‘Working hard’ and ‘hardly working’ are not the true measures of your performance. WD=F.D is the measure.
THERE IS SO MUCH TO DO
AND SO LITTLE TIME WE HAVE
I thank you for your interest in attending this presentation.

I will be happy to help you in any way I can; feel free to stop by my office (when my office door is open).
ENJOY YOUR FAMILY