

PC512

Technical Writing and Communication Skills

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DAIICT

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Previous Lecture

- ▶ Giving a Presentation
- ▶ Clauses and Sentences in English
- ▶ General Guidelines

Today's Lecture

Thesis Writing and Defence

- ▶ MTech and PhD
- ▶ What is research
- ▶ Thesis structure
- ▶ Thesis defence

MTech and PhD Degrees

- ▶ Research based degrees.
- ▶ Objective = Learning + Research Contribution + Documentation = Thesis.
- ▶ Preparation for Research and Development and Teaching Career.

What is Research

Adding to the existing body of knowledge of a topic or a domain.

What is Research

- ▶ Developing a new/original technique, observation, algorithm, theory, ...
- ▶ Continuing an original work done by others, esp. the Supervisor
- ▶ Providing an original technique, ... in an unoriginal but competent piece of work
- ▶ Developing several small original ideas, methods, and algorithms, ...
- ▶ Showing originality in testing somebody else's ideas.
- ▶ Finding a counter-example or fallacy in somebody else's ideas.

Doing Research

- ▶ Select a Supervisor (Active and Experienced)
- ▶ Select an Area
- ▶ Select a Problem
- ▶ For $i = 1$ to n
 1. Read between lines, Discuss, Understand
 2. Develop Ideas
 3. Analyse, Design, Simulate, Experiment
 4. next i
- ▶ Write papers, Submit Progress Reports, Go to Conferences
- ▶ Write a Thesis

- ▶ Final Document
- ▶ Record of Your Achievements
- ▶ Reviewed by the Supervisor and Experts
- ▶ Archived in the University Library/ ShodhGanga Repository

Organization of the Thesis

Follow the Guidelines of the University

1. Front Matter
2. Main Body
3. Back Matter

Main Body

1. **I**ntroduction
2. **L**iterature Survey
3. **M**ethod
4. **R**esults
5. **D**iscussion of Results

Remember **ILiMReD** or **ILMRD**

Introduction: Chapter 1

Main Theme = WHY

1. Broad area of your problem (2-3 para)
2. *Your Problem* (2 para.)
3. Current state of this problem in global scenario (2 para.)
4. Approach taken (1 para.)
5. Highlight of Results (2 para.)
6. *Your Contributions* (1 para.)
7. Organization of this Thesis (1 para.)

Remember: Introduction should have structure of a *funnel*.

Main Theme = WHO

- ▶ Discuss works of others working in areas similar to your problem.
- ▶ Chronological or Important first.

Method: Chapter 3, ...

Main Theme = HOW

- ▶ Basic Theory
- ▶ Your Approach in Solving
- ▶ Your Analysis, derivations, theorems, proofs, ...
- ▶ Your Case-Study, Your Choice of Data, Your Programs, Simulations ...
- ▶ Your Experiments: Lab or Numerical

You need for good research

- ▶ Solid analysis
- ▶ Analysis+Simulation based on good data
- ▶ Analysis+Lab Experiments
- ▶ Analysis + Simulation + Experiments

Results: Chapter *N* – 3

Main Theme = WHAT

- ▶ Results out of Analysis, Simulation and Experiments
- ▶ Graphs, Charts, Tables of Data

Discussion: Chapter $N - 2$

Main Theme = So WHAT

- ▶ Interpret your results not paraphrase
- ▶ Do not extrapolate
- ▶ Use numbers not adjectives
- ▶ Follow standards

Chapter $N - 1$ = Future Works (a few paragraphs)

Chapter N = Conclusion or Summary (a few paragraphs). This is the LAST Chapter.

Front Matter

- ▶ Cover page from the University
- ▶ Page with Certification and Signatures
- ▶ Title Page
- ▶ Dedication
- ▶ Acknowledgement and Thanks
- ▶ Abstract (500 words)
- ▶ Table of Content
- ▶ List of Figures
- ▶ List of Tables
- ▶ List of Acronyms used

- ▶ List of References
- ▶ Appendix 1, 2, ... with long derivations and calculations
- ▶ Codes written

Follow all the guidelines of the Department and the University

- ▶ Get plagiarism checked
- ▶ Fill up the forms
- ▶ Submit the thesis.

After Thesis Submission

- ▶ Thesis is sent to reviewers selected by the authority
- ▶ Wait for reviews
- ▶ Loop for revisions and submissions
- ▶ If comments are positive then thesis defence is arranged by the University.

Presentation + Oral Exam

- ▶ Follow the guidelines in our previous lecture.
- ▶ Dress properly.
- ▶ Have a backup pen-drive, CD-rom, laptop in case things fail in the exam room.
- ▶ Sleep for 8 hours in the previous night and be calm and show enthusiasm in the presentation.
- ▶ Do not give up on questions you do not know - try to derive the answer.

Expectation of Examiners in Thesis Defence

- ▶ Maintain time
- ▶ A good understanding of the main subject
- ▶ A good understanding of the problem and related areas
- ▶ Aware of the literature, esp. the recent papers
- ▶ Understanding of the results obtained
- ▶ Aware of the contribution
- ▶ Future extension of the work

After the Defence

- ▶ Final Corrections
- ▶ Final Printing and E-copy
- ▶ Binding of the thesis (University Guidelines)
- ▶ Submission of copies ☺
- ▶ Continue the research and writing ...

Summary

- ▶ MTech and PhD degrees
- ▶ What is research
- ▶ Thesis structure
- ▶ Thesis defence

References

- ▶ E. M. Phillips and D. S. Pugh, “How to get a Ph.D.”, UBPSD New Delhi, 1995.
- ▶ V. O. K. Li, “Hints on writing technical papers and making presentations”, IEEE Trans. on Education, Vol. 42, No. 2, 1999.
- ▶ There are several helpful websites on thesis writing and thesis defence. For example, read <https://paperpile.com/g/thesis-defense/>.