Course Timeline

- October 7\textsuperscript{th}: Project description
- October 14\textsuperscript{th}: Paperwork and Budget
- October 21\textsuperscript{st}: Successful Grant Writers (Project description due)
- October 28\textsuperscript{th}: Q & A with Research Services
- November 4\textsuperscript{th}: Review process (Final Proposal due)
- November 11\textsuperscript{th}: Other funding agencies
- November 18\textsuperscript{th}: Foundations (reviews due)
- December 2\textsuperscript{nd}: Review Panel Meeting
- December 9\textsuperscript{th}: Class Presentations
Project Description

The real **meat** of a proposal
INTRODUCTION

- First 1-2 pages described what research activity you want to pursue
- You told reviewers your objectives and how you plan to achieve them
- You told them about the methods
- You told them about significance
- Now they are hooked and hungry for more!
Background information

• Why? Because they should know what you know!
• Start from the broad topics and narrow down to specifics
• Review of literature: know differences between thesis, publications & proposal
• You want to show them your depth of knowledge and understanding of the current literature and research trends
• Build your story on the basis of what is known
References

• How many are too many?
• Depends on your field
• Use 30-40 best ones that serve YOU best!
• Give some popular review articles (recent)
• Don’t say: Recently in 1955…
• Cite leaders, old-timers and little people too
• Ego trip! So let some ride on it too (no attacks!)  
• Cite those who support your train of thoughts
How to deal with those spoilers?

• Some publications will poke holes in your story. Tell, why they are not applicable
• Please be humble!
• Avoid negative tone if at all you can (exercise)
  – Nothing is known.. Little is known
  – It is not possible… It is difficult
• Try to explain why your story stands!
You **may** use up to 5 pages for this but remember…

- This is not a space filler!
- Use only what is absolutely necessary for building YOUR story
- **Critical** review of literature
- Direct relevance to your proposal
- But it will not work...
Preliminary data

• Your own unpublished results
• Your best chance to use diagrams, colors, & charts but remember the KISS principle
• Keep it simple, sweetheart!
• Show that you mean business!
• If data does not support hypothesis, change it by going back to drawing board!
• Do not overkill or you will work for free!
Why to give preliminary data?

• You are on the right track
• You think like a scientist
• You are “objective” in your approach
• Something trivial need not be given!
• Something major should not be missed!
• No detailed methodology: for specialist
• Emphasize that you are a professional!
• 3 pages maximum,
• reemphasize your objectives at the end

Intro 1-2 pages; Background 5 pages; prelim data 3 pages: 9-10 pages are up
Experimental plan: Future activity

• Give overview of the activity to be undertaken
• Who will do what? How many years? No $ data!
• How data will be collected and analyzed
• Timetable here or at the end
• Overview: 1-2 paragraphs only
• Then take objective 1 and rephrase it in the form of a question if you can.
• Explain how it will be answered.
• So on…
• Keep to 3-4 objectives only
Avoid these traps!

• If success of your objective 2 is based on objective 1 and objective 3 needs objective 2 to work, your proposal is doomed!
• This has already been done as cited in the background
• ..and it does not work
• The positive outcome can not be guaranteed
• The negative outcome is of no use in advancing science!
Methods, Data analysis & Pitfalls

- No long boring methodology: We are dealing with experts (you are one of them!)
- Show that YOU are the expert
- Use citations if necessary (your own will be better)
- Indicate that instruments are within your reach (and you know where to get them)
- Give supporting letters if you do not know something or if crucial, make them Co-PI
- Expected outcome
- Possible Pitfalls and how to avoid them or tweak the experiment with the outcome.
- Milestones! Timetable of activities (6 month slots)

Total space available 4-5 pages
Integration of research and education
(One last page)

- Major goal of NSF
- How will you use your results in teaching
- Include within description and on last page
- How your work supports missions of your University, Department/college and group
- How your field will be advanced? Society?
- Grad students, postdocs, undergrads benefited
- Diversity and training
- Collaborate, publish and present seminars
- Novelty!
Service continued..

- Public education
- Popular talks for laymen
- Specific groups benefited: K-12 schools
- Journal clubs
- A good project just achieves the scientific goals but the best one benefits everyone who associates with it!
Assignment

• On or before October 21st, submit your project description with references to me (15 +4 pages).
• Please submit a hard copy!
• Cite references as follows:
  – Single author (e.g. Joshi, 1987)
  – Two authors (e.g. Joshi and Joshi, 1987)
  – Many authors (e.g. Joshi et al. 1987) a,b,c..
  – List references alphabetically at the end
  – Use same style for all references cited.
  – Follow what is a common style in your field