College of Engineering
Department of Materials Science and Engineering

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MSE Ph.D. Qualifying Exam (QE)

Research Proposal

Proposal Format (From NSF PAPPG)
1. Use one of the following fonts identified below:
   a. Arial (not Arial Narrow), Courier New, or Palatino Linotype at a font size of 10 points or larger.
   b. Times New Roman at a font size of 11 points or larger.
2. No more than six lines of text within a vertical space of one inch. This corresponds to single spaced format.
3. Margins, in all directions, must be at least an inch.
4. Paper size must be no larger than standard letter paper size (8 ½ by 11").
5. Number of pages: 8

Mandatory Sections
The following sections should be included in the mandatory 8 pages to be included in the proposal. These sections are typically found in the project description of a standard NSF proposal and are a good way of organizing and presenting the idea. These sections could also be used to organize the proposal presentation.

1. *Vision and Goals (~1 page):* This section should introduce your research idea by presenting the project vision and listing the project goals. It is expected to include the main hypothesis or hypotheses that will drive the research plan along with a justification. It should also motivate the research in terms of either practical applications and/or scientific interest.
2. *Intellectual Merit and Broader Impacts (~0.5 pages):* This follows the standards for an NSF proposal. Intellectual merit "should describe the potential of the proposed activity to advance knowledge". Broader impacts "should describe the potential of the proposed activity to benefit society and contribute to the achievement of specific, desired societal outcomes."
3. *Background and Scientific Rationale (~3 pages):* This section should be considered as the proposal literature review. It should be used to present relevant preliminary literature results, and to justify and relate the research plan with the main hypotheses.
4. *Research Plan (~3 pages):* Describe the methodology and action plan for the project. It is often organized in tasks or research thrusts with subtasks as needed. It should contain future action statements describing the planned work and if needed their justification. It could also refer to literature to described methods or any other specific preliminary work.
5. *Project Timeline (~0.5 pages):* This is expected for modern project management schemes. A Gantt chart including specific timelines for each task and subtasks, should be included. The timeline should be consistent with what is expected for continuity between tasks/subtasks, dependencies between them and expected deliverables (if any). Specific time divisions depend on the overall project performance timeframe. For example, if the project lasts 6 months, then divisions should be monthly or bimonthly; if the project last 3 years, then divisions could be quarters or years, as needed.
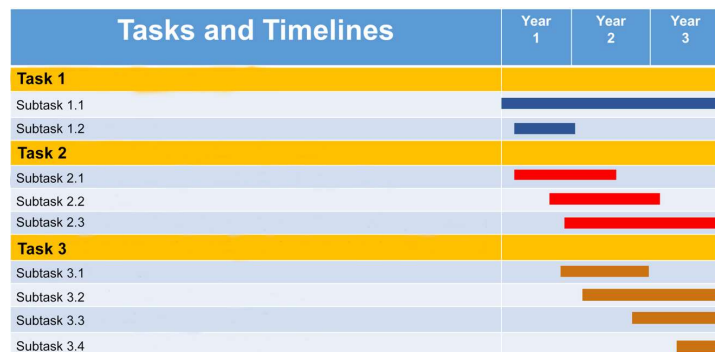

Figure 1. Gantt chart example describing the task and subtask organization and description of the timeline describing simple dependencies between the subtasks.