Applying for Engineering Undergraduate Research Scholars

Tips for Students:

General Guidance:

1) Follow the application instructions, especially the eligibility requirements and the timeline. The fastest way to have your application disqualified is to not follow the instructions.

2) Keep your audience in mind. Your applications are reviewed by a panel representing all 5 departments in the college of engineering. It's safe to expect a technical audience (assume about a sophomore-level understanding from anyone not in your major) but define any discipline-specific jargon.

3) The strongest applications tend to articulate a clear benefit to society, not just science for science's sake. This is especially important for reviewers from outside your field who may not appreciate the subtleties of your discipline, but will be more supportive if you can explain why a non-expert should care.

4) Projects that generate new knowledge tend to review better than projects in which you develop a product.

5) Don't get too hung up on the timeline. The point of the timeline is to convince the reviewers that your project is about 3 semesters in scope. Once you're in the program, you'll be paid based on whatever hours you report on a timecard up to a maximum of 450 hours, regardless of how you said you'd distribute those hours in your proposal.

Choosing Objectives:

6) State your overall objective early and explicitly, and make it easy for a reviewer to find quickly. When a reviewer first opens a proposal, the first question on their mind is "what is this proposal about?" and they won't fully pay attention to anything else you say until you answer that for them.

7) Later in the document, spell out a few scientific/technical objectives to be addressed by your research plan. The strongest technical objectives are Specific, Measurable, Achievable, Relevant, and Timely (SMART). Avoid open-ended goals that outlast the scope of your project and don't check at least a few of these boxes.

8) While this is not an explicit requirement, since humans like to think in 3's and the projects are already meant to be 3 semesters in scope, it often works well narratively to pick 3 objectives which are each about a semester in scope and build your timeline around them.

9) Be mindful of the difference between learning objectives and scientific/technical objectives. If one of your objectives is to "learn / understand / become more familiar," with something or to "develop new skills," this may be your personal educational goal, but it doesn't benefit anyone else. (These are still great outcomes for your project, but they aren't strong selling points worth devoting portions of your proposal to except for maybe in the section on personal relationship to project.)

10) "Perform literature review" is very rarely a compelling objective unless the literature review somehow adds new knowledge to your field and not just your own personal understanding. If you make a literature review one of your objectives, you're effectively telling the reviewers that you don't understand your topic well enough yet, so why should they fund you over someone else?

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Formatting:

11) Start your document with a descriptive title that says something about the project. This makes the document look more polished to make a stronger first impression, and it also addresses the question "what is this project about?" (see #6 above).

12) Make good use of headings, figures, tables, etc. to add visual interest.

13) Be mindful of white space. Include enough between headings and paragraphs to let the document "breathe" so that the reviewer is not overwhelmed by a wall of text, but avoid giant chunks of white space (for example, at the bottoms of pages or to the sides of figures). You want to leave the impression that you could have discussed your topic at length but had to edit yourself down to 2 pages, not that you struggled to fill 2 pages.

14) It's good to include a few references (especially if you have any with yourself as an author due to prior research experience!) but pick only the most important ones. Between 2-5 is usually plenty. Keep in mind:
    (i) References count against your page limits, so the more you use, the less space you have to talk about your project.
    (ii) If your references list is not tightly curated, it can feel like you're assigning homework to the reviewer who likely does not want to read all those references.

If you aren't funded:

15) Bear in mind that there is also an element of luck.
    (i) Large application pools are more competitive than smaller. (And there tend to be many more applications in fall than in spring.)
    (ii) Your application might be great, but others might still be better.
    (iii) Your project might be awesome, but the communication about how awesome it is may not have come across clearly enough to the reviewers.
    (iv) The reviewers might weigh factors differently than you would, including: GPA, prior research experience, similarity to other applications in the pool, and the strength of the proposal itself.

16) Keep trying! Historically, most students who re-applied were eventually admitted.

Tips for Advisors:

1) Don't write the proposal for them but it's ok to help them edit. Encourage multiple drafts. This is part of mentoring – they've likely never written a document like this before and are counting on your insight and experience. If they submit a proposal without your feedback, they'll likely be at a big disadvantage compared to other applicants.

2) Similarly: they don't need to come up with the idea for the project by themselves. Most likely, you'll be paying your share of the matching funds using a research grant so it's important that their project complements the goals of that grant, and you know best what would complement those efforts. By helping them to describe their project in their own words, they will have a much better understanding of the objectives they seek to accomplish.

3) If you advise multiple students who apply in the same cycle, you are competing against yourself and you are inviting comparisons between them. Each application needs to stand well on its own, and there should be plenty of daylight between the projects so that a reviewer from outside of your immediate field will be able to tell the projects apart. Figures should be visually distinct too.