

Example Draft of a GRFP Letter of Recommendation

The following draft is a mashup from several different student recommendation drafts. You probably won't have this much to say for each category for any one referee, but the answers should give you a sense of the sort of information NSF is seeking from the referees about you.

Note: You should make an outline like the following one for each professor who will be writing a letter of recommendation for you. You should tailor the information so that the letters reinforce each other, but don't repeat each other. For example, one professor may know more about your out-of-class activities (broader impact) and another may know more about your research performance (intellectual merit). Find faculty who can amplify what is in the rest of your application, not just repeat it. Your transcript will tell the reviewers that you have a 4.0 – a letter that just repeats the information found in the transcript, doesn't tell the reviewers anything they didn't already know. The subtext of the letters should be that NSF should invest in you because you have the ability to become an excellent researcher contributing to the greater good of society.

Note: Remind the professor of every bit of information that could be important. Include courses, projects, committees, organizations, ... GIVE THE DATES.

Our relationship

- **How long and in what capacity have you known me**

You have been my advisor since Fall 2013. You first had me as a student in Intro to Computer Applications in Fall 2013. Since then, you have supervised my research for two SURG grants (Fall 2013 and Spring 2014). Also, I'm a member of ASCE for which you are the faculty advisor

My ability to perform research:

- **My background and preparedness to do scholarly work in my chosen area of research**

This is important since I am switching disciplines. In my essay, I explain that there are strong parallels between civil and mechanical engineering especially in Computer Aided Engineering (modeling and simulation). It would help if you could reinforce this.

My proposed research involves quantifying uncertainty in models and model composition, both important issues in civil engineering. In my civil engineering coursework, I was introduced to modeling engineering systems, simulating the models, and making decisions based on the results. Modeling and simulation is a major part of the field of transportation engineering, where I devoted a significant portion of my undergraduate coursework.

I also gained experience making engineering models through my participation in the National Science Foundation Research Experience for Undergraduates (NSF REU) program. I built a mathematical model of the reinforced concrete beam that I had designed, built and tested. I used the results from the tests and the model to conclude that the internal strain gages accurately and precisely measured strain.

- **My imagination and probable creativity**

When I was working on the SURG grant with you, you commented several times that I gave you a fresh perspective on the problem because I thought of the problem in ways you hadn't thought of.

- **My likelihood of performing creative research**

The project that I completed for Highway Engineering involved creativity. With infinite possible selections for roadway locations we had to pick a few that were representative and develop them further so that a final selection could be made.

Remember that near the end of my NSF REU project, we couldn't explain the tensile concrete's stress-strain curves similarities to a stress-strain curve of a yielding material. It occurred to me that using low magnitude repetitive loads during testing might have invoked a special kind of behavior in the concrete. To check it out, before talking to anyone on the team, I visited the library and returned with an explanation for the phenomenon. Our testing procedure had magnified the effects of micro cracking in the beam! You complimented me saying that this was a significant contribution to the project team's knowledge base and wouldn't have been known had I not thought of the possibility.

- **The strength of my proposed research**

From my experience with the SURG grants and my summer REU, I know that my proposal is on the cutting edge. It is challenging but feasible. I hope that you will be able to read my attached research proposal and give a short, positive review to the NSF reviewers. Since you are a well-known expert in this field, and your evaluation of my proposal will strengthen my application.

- **The strength of my previous research**

My experience in your lab was related to modeling and simulation. I helped W and X with their research on validating a traffic system model at the arterial scale. I experienced using state of the art engineering technology to conduct research in your lab and mobile lab.

You also oversaw my participation in the NSF REU program. Even though the program lasted only 10 weeks the academic paper that I completed was basically a miniature thesis. I performed a literature review and from that posed a research question. I then answered the research question through the completion of the project and wrote a report about the project details, the conclusions, and suggestions for future work.

- **The strength of my academic record**

All of the following information will be part of the NSF application, so I am just repeating it here so you don't have to look it up. Since you know that my first semester junior year grades were a little low due to a family emergency, you might mention that in the letter if you are comfortable with that.

Undergraduate GPA – 3.5/4.0

Minor in Mathematics

GRE Scores/Percent Below: Math – 800/92; Verbal – 660/92; Analytical 5.0/71

Honors / Awards: ASCE student of the year 2006; Baker Fellowship junior year

My character:

- **My leadership abilities and potential**

While taking full-time coursework, during my junior year, I worked as the diversity scholars tutor, as a teaching assistant for the engineering department and as a resident assistant at the dorms. This year, I am the president of ASCE and the treasurer for my fraternity. I have also revived the student chapter of Habitat for Humanity.

- **My ability to work independently**

While employed by you as an undergraduate research assistant, I had to work alone learning about the Autoscope software and the capabilities of the mobile lab. I used the knowledge that I gained to help the group gather research data.

You could also mention my independence as an advisee. I often gathered advice from you about what classes to take, but I always came with a plan and set of questions.

- **My dedication**

- **My motivation to succeed**

As my undergraduate advisor and instructor for two courses, you have personally observed my dedication to academics and my motivation to succeed.

- **My communication skills**

- **My ability to communicate complex ideas clearly both in written and spoken English**

You could talk about the report that I wrote during my NSF REU experience. I had to communicate complex ideas and did so in a logical and systematic way.

You could also mention the talk I gave in Projects. You said it was the most coherent explanation of bridge inspection practices that you had ever heard.

- **My personality, social conscious, and relationship skills**

From the Project class, you have observed me in teams and know that I can work both as a leader and a good team player. I have worked to improve the connection between the campus and the local community, which was one of my motivations for reviving the student chapter of Habitat for Humanity. In the essays for my application, I talk about how my research could help create

My potential to have broader impacts:

- **My efforts to enhance scientific and technical understanding**

- **My ability and interest to advance science and technology in a broader sense**

When I become a professor, I will strive to be an excellent resource to assist students and the learning community by enhancing their understanding of technical and scientific matters, through clear writing and informative lecture. I have gained experience with this through my service as a teaching assistant for engineering and mathematics departments here.

This semester, I'm taking the teaching practicum short course offered here. This program gives students the opportunity to actively teach a course (create lesson plans, give lectures, have office hours, assign grades) under the supervision of a professor.

- **My ability to foster the integration of research and education**

I think this should be the primary goal of any engineering professor. There are new breakthroughs every day, and it is the job of the professor to understand these breakthroughs, measure their application to the core engineering principles in the courses he or she teaches, and develop a structure to incorporate these new ideas into class lectures. My experiences as a teaching assistant and youth camp leader have prepared me to do just that.

I helped with the junior-high school engineering day camp. Here junior high school students were introduced to the research that is being conducted at UNO. I had to explain what the capabilities of the mobile lab were and show the students how we could use these technologies to gather data by measuring the speed of students running. I helped to increase the engineering awareness of these students and promoted their interest in engineering in general.

- **My promotion of the advancement of diversity in science**

I served as a "big sibling" for several minority engineering students the fall of my junior and senior year, contacting them over the summer, answering their questions about dorm life, class schedules, and anything else. I also kept in touch with them throughout the semester, in case they had more questions. I volunteered for this program because one of my friends told me how isolated he felt throughout his freshman year.

- **My efforts to generally benefit society**

- **My contributions to the community (social and scholarly)**

During my undergraduate education I have helped the following organizations:

- Race for a Cure – ran laps to raise money for breast cancer research
- Stephen's Center (Homeless Shelter in Omaha) – served food, checked guests in and helped residents get used to the facilities
- Habitat for Humanity – Reinstated the student chapter; contributed engineering knowledge to help build houses, lead/supervised small groups of volunteers
- Food Bank – collected cans for the Food Bank as president of Chi Epsilon
- Teaching Assistant – Calculus (Spring 2013, Fall 2014) and Statics (Spring 2014)