



# National Science Foundation Graduate Research Fellowship Program: IMPLEMENTATION GUIDE

The NSF GRFP benefits both the campus and its students with three years of support, providing a \$34,000 stipend per year and a \$12,000 educational allowance to the institution. UC Irvine students are highly competitive for this award: with 27 awards in 2017, our campus is third in the UC system, behind UC San Diego (28 awards) and was 14<sup>th</sup> nationally. The following Frequently Asked Questions and recommended Best Practices may assist schools, programs and faculty in incorporating the National Science Foundation Graduate Research Fellowship Program (NSF GRFP) application process into the academic curriculum. Advice regarding letters of reference is also provided.

## **What resources does the UC Irvine campus provide to support the NSF GRFP application process?**

- Graduate Division sends departments the names of students who are likely to be eligible to apply.
- The Graduate Resource Center offers NSF GRFP workshops.
- The Graduate Resource Center's writing consultants are available to meet with students to review their applications and to make suggestions. Due to high demand, students are strongly encouraged to make an appointment by calling 949-824-3849.
- Fellowship Application Samples: Students may view successful NSF GRFP applications at the GRC.
- Dr. Sandra Loughlin holds fellowship advising hours at the GRC. She is available to discuss application questions and provide feedback on fellowship applications. Schedule an appointment by calling 949-824-3849.
- Dr. Celina Mojica is available to meet with students to discuss their applications and provide feedback. She was an NSF GRFP reviewer for the 2015 cycle. Schedule an appointment by emailing her at [cmojica@uci.edu](mailto:cmojica@uci.edu).
- Participation in professional development activities through the "Graduate Professional Success" (GPS) initiative can be incorporated into students' training plans and thus increase broader impacts. See <http://www.grad.uci.edu/cascade/professional-success/index.html>.
- Broader Impacts Fairs are held every Fall and Spring quarter. These fairs provide opportunities for students to meet and get involved with organizations located on and off campus. Times and dates for the fairs will be advertised via Grad Weekly and Grad Monthly.

## **Who should be encouraged to apply for NSF GRFP?**

- All eligible students should be encouraged to apply. General eligibility requirements include:
  - U.S. citizens, nationals, or permanent residents
  - College seniors, first and second year graduate students
  - Have completed no more than twelve months of full-time graduate study in a Ph.D. or research-focused Master's program
  - Students who have previously completed a Master's degree and or Professional degree are eligible for the GRFP if they meet the "extenuating circumstance" criteria
  - NSF is very interested in early career applicants, and success rates are higher overall for students applying as college seniors.
- Even students with below average GPAs have received NSF GRFP awards.
- GRE scores are NOT part of the NSF GRFP application.

### **What fields of study are eligible for the NSF GRFP?**

- The fields of study supported by NSF GRFP include:
  - Chemistry
  - Information & Computer Science
  - Engineering
  - Geosciences
  - Life Sciences
  - Materials Research
  - Mathematical Sciences
  - Physics & Astronomy
  - Psychology
  - Social Sciences
  - STEM Education & Learning Research

### **Should first year students who received Honorable Mentions reapply?**

- No. Due to changes in eligibility, honorable mentions will not be eligible to apply if they have already applied once as a graduate student.
- Rather, applicants who received an honorable mention as an undergraduate/baccalaureate holder should be encouraged to reapply as a graduate student.

### **How can schools and programs encourage faculty to support the NSF GRFP application process?**

- Create school plans that emphasize the importance of this fellowship.
- Designate a key person in the school/program to lead the effort.
- Identify courses in which guidance on the application process can be incorporated.
- Talk to faculty who have received NSF grants and/or served on NSF review panels, as these faculty are more likely to understand the broader impacts criterion.
- Host local workshops specialized by discipline.
  - This allows subject-specific discussions about the application process.
  - Localized workshops at the school/program level will reinforce the message that it is strongly encouraged that *all* eligible students should apply and that they are supported in doing so.

### **Can NSF GRFP information be integrated into first and second year courses?**

- Yes. Create a quasi-requirement for all eligible students to apply; students who are not eligible to apply can serve as peer reviewers of draft applications.
- The instructor of the course may also be the designated contact for the school/program.
- Consider inviting a student who was in a class in which NSF GRFP was successfully integrated and who received the GRFP to talk about his or her experience at a workshop for instructors.

### **What letters of reference are appropriate for NSF GRFP applicants?**

- Letter writing for the NSF GRFP is different from that for most recommendation letters, and faculty need more guidance as to what makes a strong letter.
- It is important to emphasize the applicant's independent contribution to research so that the proposed research is not perceived as too closely tied to that of the faculty mentor.
- Solicit names of letter writers from students, and provide them with information on formatting and suggestions for content.
- Follow up with letter writers inside and outside UCI.
- Applicants should solicit more than the required number of letters in case a letter writer misses the deadline.
- Letters also need to explicitly address intellectual merit and broader impacts.
- For new incoming students, reviewers suggest that faculty speak to why the student was accepted to the graduate program.
- All letters should mention how students will be mentored. Weaving professional development into the plan will enhance broader impacts.
- Strong letters include discussion of leadership skills and potential.
- NSF wants to know the nature of the student's research work:
  - Did the student work independently?
  - Did the student contribute to the overall direction of the research project he or she worked on? If so, how?
  - What was the student's relationship to the work and to others involved in the research?
- DO NOT:
  - Write "call for more information." Reviewers need all the information written in the letters.
  - Compare student to other applicants.
  - Contradict what the student says in his or her written statements.

**Since first year students are new to UCI, who should provide them with NSF GRFP application guidance?**

- Schools/programs are encouraged to designate a key person (a faculty member or GSR with faculty supervision) who is invested in the GRFP application process. This allows students to have a contact person in their program for feedback and advice.
- If the NSF GRFP application is a requirement, then the student may approach his or her instructor for guidance.
- Students are also encouraged to take advantage of NSF GRFP support offered through the Graduate Resource Center.

**Must students have determined a research plan before applying?**

- Yes. Student do need a strong research plan. However, unlike the NSF dissertation improvement grant application, NSF GRFP awards fund the INDIVIDUAL and not the research project.
- Reviewers are most concerned that fellows do something significant, become a scientist and a leader in their field.
- It is important to emphasize the applicant's independent contribution to research so that the proposed research is not perceived as too closely tied to that of the faculty mentor.
- Students are not expected to commit to the proposed research in the application.
- Reviewers are looking for demonstrated understanding of research design and methodology.
- IMPORTANT NOTE: Applicants must demonstrate an independent idea and that the proposed research is their own work.
- Research plan should include typical sections (in the following order):
  - Introduction and problem statement
  - Hypothesis
  - Methods to test hypothesis
  - Anticipated results or findings
  - Expected significance and broader impacts
  - Very short list of important literature citations
  - How the proposed research fits into the applicant's larger narrative/trajectory of past research, personal history and future plans

**Do the intellectual merit and broader impacts review criteria only apply to certain sections of the student application?**

- No. All sections of the NSF GRFP application, including the letters of recommendation, are to address intellectual merit and broader impacts.

**What is meant by "intellectual merit"?**

- Review panelists may consider the following for INTELLECTUAL MERIT:
  - Academic performance
  - Awards and honors
  - Communication skills
  - International experience
  - Independence/creativity
  - Research plan
  - Choice of institution
  - References
  - Research experience

*NOTE: All of these do not have to be met*

**What is meant by "broader impacts"?**

- Review panelists may consider the following for BROADER IMPACTS:
  - Prior accomplishments
  - Leadership potential
  - Future plans
  - Individual experiences
  - Integration of research and education
  - Potential to reach diverse audiences
  - Impact on society and connectivity
  - Community outreach

*NOTE: All of these do not have to be met*

- Participation in professional development activities through the "Graduate Professional Success" (GPS) initiative can be incorporated into students' training plans and thus increase broader impacts. See <http://www.grad.uci.edu/cascade/professional-success/index.html>.
- Broader Impacts Fairs are held every Fall and Spring quarter. These fairs provide opportunities for students to meet and get involved with organizations located on and off campus. Times and dates for the fairs will be advertised via Grad Weekly and Grad Monthly.

## TIPS FOR NSF GRFP LETTER WRITERS

EMAIL SENT TO SOCIAL SCIENCES FACULTY FROM DEAN MAURER WHEN HE SERVED AS ASSOCIATE DEAN.

Note that some examples and details will differ for your School. NSF requirements change periodically. Please confirm all instructions, deadlines and links if you decide to send your own version of this message to your faculty.

Submitting a letter on behalf of a GRFP applicant is unnecessarily complicated, and the content of the letter must be targeted to this particular competition. **Please read all the information below carefully before you begin.** The NSF requires your letter be ON LETTERHEAD, and TWO PAGES MAXIMUM. Your letter should include your name and title, department, and institution or organization.

1) Faculty will first receive an email from the NSF indicating that an applicant has selected them to write a reference. Second, after you receive that email, you will need to follow the instructions therein to REGISTER for a special NSF ID in order to submit a letter on behalf of a student applicant. You must do so before the deadline (But you can't do it until the student submits their application). Even if you already have an NSF ID and Fastlane password, you still need to complete this step, as the NSF GRFP uses a different registration system. If you did it last year for another GRFP applicant, you will need to register again.

Go here: <https://www.fastlane.nsf.gov/grfp/Login.do>, click on Register and Submit Reference Letter, and follow the instructions, with reference to the email you should have received from the NSF -- if you think you are writing for a specific student and did not receive an email asking you to submit a reference, call the student immediately and call the NSF GRFP program at 1-866-673-GRFP (4737) (office hours: Monday-Friday, 8:30 am - 5:30 pm EST) or email [info@nsfgradfellows.org](mailto:info@nsfgradfellows.org).

Note that the NSF is only accepting letters that come in by the deadline.

2) **The content of your letter:** The NSF GRFP is looking to support a promising individual, not just a research project. So, discussing the student's past experiences, present plans and potential for contributions to science and broader impacts for society is important. Specifics help more than generalities. Short, perfunctory letters are not helpful. Please discuss both the intellectual merit and broader impacts of the student's plan of research. It is helpful to provide specific information on mentoring available and special programs in your department and the School (e.g., grant-writing workshops, the School's IRB and Responsible Conduct of Research workshops for grad students, ORU-related activities or other research infrastructure that will assist in preparing your student for a research career). For lab-based projects, stress the independent contribution that the student has made.

**Fully half of the scoring is for Broader Impacts.** The NSF asks that reference writers address broader impacts in the letter of reference. This includes the student's prior work (community service,), future plans, individual experiences, leadership potential, etc. There are two categories of broader impacts and the student must demonstrate both: stuff they did in the past; and stuff they are proposing to do now, as part of their training. The student needs to construct a narrative: "I did this as an undergrad, now here's what I am going to do as a grad student and beyond..." Tutoring is a good example, diversity and outreach experience (however defined); clubs; leadership roles in clubs; and the student must discuss what they did in that position rather than just mentioning/listing it. If students are having a hard time coming up with future broader impacts: maybe suggest things like involvement in Global Connect; the DECADE diversity mentoring project; departmental grad student clubs; involvement in societies that bring the science into the community; advocacy; etc. This does not mean neglecting Intellectual Merit, however - the other half of the scoring is for the intellectual contributions of the project. Yet, former panelists state that the primary reason applicants fail to rise to the top is lack of attention to Broader Impacts.

Mention any relevant ORUs or other available and relevant research infrastructure in proposals/letters of reference. Discuss mentoring plans -- if your department has a regular mentoring framework, or workshops or methods trainings, student-directed or run activities; etc., mention them as part of a mentoring plan. The School has School-wide "responsible conduct of research" trainings (as of last spring) -- you can mention this, too. The School will also have IRB workshops this year. Additional letter-writing tips are available on the NSF website - [https://www.fastlane.nsf.gov/NSFHelp/flashhelp/fastlane/FastLane\\_Help/grfp\\_faqs\\_reference\\_writers.htm](https://www.fastlane.nsf.gov/NSFHelp/flashhelp/fastlane/FastLane_Help/grfp_faqs_reference_writers.htm)



## NSF GRFP Best Practices

**School Leadership:** Have School leadership communicate the importance of NSF GRFP to faculty and students. This can be done in faculty meetings, email, etc.

**Professional Development:** Incorporate professional development activities into students' training plans to increase broader impact. See <http://www.grad.uci.edu/cascade/professional-success/index.html>.

**Ethics and Responsible Conduct of Research (RCR):** Incorporate research ethics and RCR into students' plans.

**Workshops:** Hold workshops for faculty and students on the application process. Invite recipients from previous years to speak about their experiences. Encourage faculty and students to attend Graduate Division workshops.

**Provide Feedback:** Provide an opportunity for students to receive faculty and peer feedback and revise their proposals. Encourage students to make an appointment with a writing consultant in the Graduate Resource Center. Faculty should be encouraged to review applications of students inside and outside of their labs.

**Build on Past Success:** Provide successful applications for students to review as models.

**Grow the Number of Applications:** Encourage as many students to apply as possible. Consider incorporating NSF GRFP applications into a course or providing a financial incentive for demonstrated proof of submission. Encourage eligible students to reapply.

**Serve as Reviewers:** Encourage faculty to serve on NSF GRFP review committees.

**Provide Support:** Consider appointing a central point person (either a faculty member or GSR with faculty supervision) for the department or School to provide information and guidance on NSF GRFP.

**Start Early:** Encourage students to work on their applications over the summer and to request letters as soon as possible. Emphasize NSF GRFP at orientation activities.

**Contact Letter Writers:** Provide specific instructions for faculty members writing letters of recommendation. Ask students to identify their letter writers, including those at other institutions, and consider reaching out to provide tips, registration information, and reminders. Ask letter writers to notify a school contact when letters have been submitted.

**Emphasize Broader Impacts:** Reviewers are extremely interested in the impact of the proposed research on society, education, etc., as well as outreach efforts by students, even if that outreach is unrelated to their research.

**Highlight Conference Presentations:** Past reviewers have noted that conference presentations are taken very seriously in the review process, and encourage students to list all talks, even if they are small or local.

**Demonstrate Grit:** If applicable, it can be helpful for a student to explain how they have overcome any personal hardships or challenges. Students who are from underrepresented minority groups, from underserved communities, or are first generation college students may want to highlight how their background has impacted their academic experiences.

**Call Attention to Student Contributions:** In fields where a graduate student's research proposals mirrors their advisor's work, explain how the student's research is unique and how the student has contributed to the project.

## Sampling of how these practices have been implemented:

### School of Education

- The School of Education holds workshops led by prior NSF GRFP recipients.
- The School sends samples of successful proposals and tips on writing effective letters of recommendation to all faculty.
- In the case of students seeking letters outside of UCI, the School of Education sent letter writers information about the NSF GRFP program and requirements for letters.
- The School hired a GSR who had previously applied and been successful. The GSR worked with the 8-10 students who were eligible to apply. The GSR was paid using block money – a quarter of summer support (\$6,000) – and the support occurred from the end of summer through end of fall. The GSR held group meetings, provided individual feedback, and discussed letters of recommendation.
- In 2016, Education will hold a 3-day academic writing workshop for all incoming students. At the workshop, students will start a draft of a research statement. Cost: \$1,000 as a stipend.
  - The students who are eligible to apply for NSF GRFP will continue to work with the person who ran the workshop. They plan to hold a weekly group meeting as well as individual meetings.

### School of Physical Sciences

- In the School of Physical Sciences, NSF GRFP is introduced at each departmental new student orientation. Lori Green, Assistant Director of Research Development, speaks for approximately 20 minutes in order to acquaint students with NSF GRFP and other fellowship opportunities.
- Lori Greene then holds a four-week workshop for four Fridays in a row, beginning on the first Friday of the fall quarter. All students in the School are invited.
  - Workshop one: overview of NSF GRFP and the personal statement
  - Workshop two: round-robin – students read and comment on each other's draft essays
  - Workshop three: research and past experience essay
  - Workshop four: round-robin on the second essay
  - Past awardees are invited to the workshops and assist in reviewing the essays.
  - The focus of Lori Greene's advice is on reframing the essay. She does not provide line by line edits.
- Faculty buy-in is key. The faculty have to work with students on the research essay.
  - The Chemistry department is particularly supportive of students, and faculty read and comment on draft NSF GRFP applicants even if an applicant is not in the faculty member's lab.
- The only way to increase the numbers of awards is by increasing the number of applicants. Even if students don't receive an award, they will learn valuable grant writing skills.

### School of Social Ecology

- In Psychology & Social Behavior, the norm is for doctoral students to apply for this fellowship. The Graduate Director introduces incoming students to NSF GRFP during the summer, before they enter. When students are assigned advisors, the advisors expect to work with students on their applications.
- The School of Social Ecology uses a required seminar for all doctoral students as a basis for promoting and supporting students who are applying for NSF GRFP.
- NSF GRFP is an assignment for the methods course that Psychology & Social Behavior students take in their 2nd year. Those students who are not eligible for NSF GRFP must apply for Ford Fellowships. The instructor provides applicants with feedback once during the quarter.
- The Graduate Director served on the NSF GRFP review panel to learn more about how the criteria are applied. With her own advisees, she reviewed and commented on multiple drafts of all of the documents.

### School of Social Sciences

- The School of Social Sciences created a Dean's Fellowship Review Committee in order to provide fellowship applicants (not only for NSF GRFP, but also for other fellowship competitions) with feedback.
  - The School set up an email address, [fellowshipreview@mail.ss.uci.edu](mailto:fellowshipreview@mail.ss.uci.edu), to which any student could send their proposal, and would receive 3 detailed reviews back within 48 hours.
  - Reviewers were previous winners or honorable mentions of these awards.
  - Once a proposal was sent to that email address, it would automatically go to all potential reviewers, who would then list themselves on an online excel sheet as one of three reviewers designated for that proposal.
  - The school pays \$50 per review.

- Associate Dean Kourosh Saberi volunteered to be an NSF GRFP reviewer for the 2014 competition to gain familiarity with this program.
- In fall 2012, in a course required for all first-year Anthropology students, Professor Tom Boellstorff dedicated time during class to discuss NSF GRFP application components, review criteria, and peer review discussions.
  - 7 out of the 12 students in the class were eligible for the GRFP. All 7 eligible students applied. 5 students received the GRFP and 1 received an honorable mention.
  - During three different weekly meetings of the class, Boellstorff dedicated about 30 minutes to go over student proposals. He projected student proposals up on the screen so all students were able to see the proposals and provide comments.
  - Students were able to see several revisions of the same proposal during this process. In a survey, students commented how useful this process was.
  - Students were strongly encouraged to solicit as much input from their faculty advisors as possible.
  - Professor Tom Boellstorff personally reviewed all 7 Anthropology proposals.

*The Henry Samueli School of Engineering*

- When Graduate Division sends the School a list of current and incoming students who are eligible for NSF GRFP, the School sends a direct email to them encouraging them to apply. The email lists the different workshops Graduate Division hosts about the NSF GRFP.
- Engineering has offered a 1-unit Fellowship Opportunities Seminar in which the school provides resources to students about various fellowships. They partnered with Lori Greene, who allowed Engineering students to attend her series of seminars detailing aspects of the NSF GRFP.
- To incentivize fellowship applications, the School pays students a one-time \$250 stipend if they submit an application to a national fellowship. In order to receive the stipend, students are required to meet with a Writing Consultant in the Graduate Resource Center. Students do not need to receive an award to receive the stipend.