

Graduate Grants Writing Workshop: Engineering

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From earlier workshops:

- Information at OU on proposals/grants
 - Center for Research Program Development and Enrichment, <http://crpde.ou.edu>;
<http://crpde.ou.edu/workshops>; OU Vice President for Research, <http://vpr-norman.ou.edu>;
<http://vpr-norman.ou.edu/funding/VPR-funding-opportunities>;
 - Research liaisons:
<http://vpr-norman.ou.edu/research-liaisons>;
 - Colleagues, mentors (they're here – find them)
 - Don't feel like you've got to do it all on your own

Why prepare proposals

- Faculty
 - Research in engineering is usually expensive
 - You want funds to carry out something of interest
 - Tenure requires grants (as well as other things)
- Grad students
 - Academic career will require it (both to get a job, and to fund research)
 - Convincingly pitching an idea is a valuable skill
 - Can add flexibility/new experiences to grad studies
 - Can help with current research
- Undergrads
 - Fellowships open doors, research opportunities

Proposal development strategies*

- Key questions for investigators:
 - What do you intend to do?
 - Why do you want to do it?
 - How will you plan to do it?
 - How will you know if you succeed? (assessment)
 - What benefits will accrue if the project is successful?

These questions apply both to the technical aspects of the proposal and the way in which the project may make broader contributions.

*The next several slides are from the presentation by NSF Program Manager Garie Fordyce at the 2012 Oklahoma EPSCoR grants workshop,

<http://www.oepscor.org/research/presentations/2012-nsf-grants-workshop-presentations>

Proposal Development Strategies for Individual Investigators:

- Determine your **long-term** research and education goals (valuable to you, but clear statement often required in the proposal)
- Develop your bright idea
 - Survey the literature (you MUST know it and show it, and you must expect that your proposal reviewers will know it)
 - Contact other investigators working in the area
 - Prepare a brief concept paper (white paper)
 - Discuss with colleagues, mentors, ... folks who, with your best interests in mind, will be critical

Proposal Development Strategies for Individual Investigators:

- Prepare to carry out your project
 - Determine available resources
 - Realistically assess your needs (equipment, students, post-docs, travel funds, materials and supplies, space, computing facilities/time...)
 - one such need might be expertise, i.e., a collaborator in another discipline)
 - Develop preliminary data (generally expected, but for some programs less important) **How much?**
 - Present to colleagues, mentor, others
- Determine possible funding sources

Proposal Development Strategies for Individual Investigators:

- Read solicitation instructions carefully and completely
 - When you find a solicitation that looks like a fit, this might be a good time to contact the program director
 - Be prepared; have the white paper ready
 - Be open to suggestions
- Prepare your proposal narrative, **budget**, and all the other sections (see NSF presentation on EPSCoR site, for example)
 - this is another good time to read solicitation instructions carefully, noting deadlines, etc.
 - Much of this boilerplate can be used again

Find Support for Proposal Writing

- NSF Publications
 - Program announcements and solicitations
 - Proposal & Award Policies & Procedures Guide
 - Program Web pages
 - Funded project abstracts
 - Reports and special publications
- Targeted workshops (campus, **EPSCoR**, [technical society](#)...)
- Program officers
- Mentors on campus and in your department
- Former review panelists
- Sponsored Research Office (CRPDE)
- Successful proposals and proposal writers

(If appropriate, serve on a review panel)

For More Information:

Ask Early, Ask Often!

[nsf.gov/staff](https://www.nsf.gov/staff)

[nsf.gov/staff/orglist.jsp](https://www.nsf.gov/staff/orglist.jsp)

[nsf.gov/about/career_opps/rotators/index.jsp](https://www.nsf.gov/about/career_opps/rotators/index.jsp)

So, where's all the money?

(depends on your idea)

- Government (\$\$\$) – NSF, DoE, NIH, EPA, USDA, AHA, DoT, DoEd...)
- Military (\$\$\$)
- Corporations (\$\$)
- Foundations (\$ to \$\$\$)
- Organizations (\$)
- Internal (university) funds (\$)

A convenient list: <http://www.okepscor.org/resources>

Some types of proposals:

- Fellowships (e.g., NSF, NASA, DoE, NRC, NDSEG...)
 - **Search** government funding agency sites for information – timing, topic eligibility (note, I received two emails yesterday)
 - Criteria, format, requirements vary significantly, as will research areas considered and criteria for selection

Comments on selection criteria*

- Excellent grades (no hard cutoff, but 3.8 or better seems the norm)
- Excellent GRE scores (no hard cutoff, but >80% in all categories, >90% for most)

The above two criteria reduce the size of the pool to about twice the number of awards

- Previous research experience (1st author, co-author, lab experience)
- Letters of recommendation – select those who know you well
- Careful (knows literature, realistic – or at least not naive) essay

*Chances are, someone in your department has served recently on a review panel; consult them, or check with CRPDE

Some types of proposals:

- CAREER (NSF, some other agencies), young investigator:
example outline of the 15 page project description:
 - Objectives and relation to department mission and PI career goals (1 pg)
 - State of the art (2.5 pages)
 - Research plan (7.5 pages), including:
 - Proposed research
 - Preliminary results
 - Work plan
 - Assessment and dissemination
 - Education plan (4 pages, including dissemination)
 - Long term broader impacts (1 page)
- Examples are probably available

Some types of proposals:

- Single to several investigator project grants:
 - Most common
 - Like all the others, highly competitive
 - Example, [review guidelines](#)
- Examples of successful proposals are probably available
- Large program grants:
 - Involve multiple investigators, institutions
 - Be open to participation

Some sites:

- OU:
 - <http://crpde.ou.edu>;
 - <http://crpde.ou.edu/workshops>
 - <http://vpr-norman.ou.edu>
 - <http://vpr-norman.ou.edu/funding/VPR-funding-opportunities>
 - <http://vpr-norman.ou.edu/research-liaisons>;
- <http://www.okepscor.org/research/presentations/2012-nsf-grants-workshop-presentations>
- <http://www.okepscor.org/resources>
- <http://www.ok.gov/ocast/>