ADVICE TO PROPOSAL WRITERS

The following steps are provided to help the proposal writer understand the steps that go into preparing a proposal and to share some advice that others have found useful.

Step 1 - Before You Write

Getting Started

NSF grants provide funds based on merit, not on need.

A good proposal begins with a clear idea of the goals and objectives of the project. For example, creating a course or curriculum, improving a laboratory by teaching new concepts directly, teaching new material to undergraduate faculty, or preparing future technicians or K-12 teachers in a more effective way.

In addition, a good project begins with a sense of why it will be a significant improvement over current practice.

Envision what improvements your project will make, and then ask yourself what activities and course(s) must be developed, what instruments will be needed, or what coalitions must be formed to make the desired improvements. Focusing first on the goals and objectives helps ensure that the activities are designed to reach those goals.

After the goals and associated activities are well defined, consider what resources (e.g., people, time, equipment, technical support) will be necessary as part of the request to NSF. A better proposal is likely to result if the goals and activities are clear before resources are considered.

Your project should be innovative within its context. It should not be designed merely to bring your institution up to the level of other similar institutions, nor should it be used to fill program deficiencies that have been caused by changing student registration patterns.

Projects should explore teaching and learning methods that use equipment, scientific knowledge, or teaching techniques in effective ways; perhaps by adapting techniques to a new context or by teaching in a novel or attractive way.

In addition, more extensive projects, such as ATE Centers must show clearly that they can initiate important changes in the teaching of undergraduate science, technology, engineering, or mathematics for a significant segment of the community.

Mention what work has been done in preparation for the project, and describe specific attempts that have been made to try the proposed improvement on a small scale.

Evidence of preliminary work demonstrates planning and commitment to the project and often indicates the project's potential for success.

When the proposal requests significant funds for equipment, it is helpful to consider alternatives and explain why the instruments chosen are particularly suitable for the project and why others, especially less expensive ones, are less suitable.

Get advice from people who have been successful in the proposal process. (See the Getting Advice Section listed in Step 3 and consider these activities early in the process.)

Gathering Background Information

When writing a proposal, look for previously awarded NSF projects or work supported in other ways that are similar. The relationship of the proposed project to the work of others should be described. In addition, the proposal must give appropriate attention to the existing relevant knowledge base, including awareness of current literature. Results of previous projects may have been presented at professional meetings or published in journals, and NSF regularly publishes abstracts of its recently awarded grants. Information can also be obtained from NSF's Web site at http://www.nsf.gov/. DUE has developed a Web-based *Project Information Resource System* (PIRS) to provide a gateway to award abstracts and other information about projects supported by the division. The PIRS database is searchable by PI name, awardee organization, DUE program, project discipline, abstract keywords, and other criteria. The PIRS Web page can be found at https://www.ehr.nsf.gov/pirs_prs_web/search/. When you find a funded project that is similar, call the principal investigator, discuss his/her project, and ask him/her to send or e-mail you a copy of the grant proposal. You will then be better able to see how that project is outlined and developed and how it meets certain needs on that particular campus and in the broader community. Clearly you will wish to use this only as guidance and should not copy the project. There will be differences in what is needed in each new project.

Feel free to call a DUE Program Director (current number 703-292-8670) when unsure about any details or procedure.

Looking at the Program Solicitation or Announcement

Identify the program or programs that best fit what you hope to accomplish.

Read the ***Program Solicitation or Announcement*** guidelines carefully and consider what is requested. Each program's solicitation specifies requirements for that program and information that is used to review the proposal.

The ***Program Solicitation*** clearly spells out requirements, including format requirements. All parts of the proposal should conform to the requirements, i.e., target dates, font size,

page limits, program objectives, budget limits, cost sharing, etc. The proposal should be concise and not exceed any text restrictions.

The review criteria are particularly important to consider in writing the proposal. Keep in mind that different programs may have special emphases for review. These will be mentioned in the *Program Solicitation*. You should consider, if appropriate, how your project might address these areas.

In some cases, programs have specific requirements that differ from the general requirements. When there are differences, the guidelines closest to the program should be followed (i.e., follow the program guidelines provided in the *Program Solicitation*). For example, if the *Program Solicitation* calls for double line spacing while the NSF *Grant Proposal Guide* leaves line spacing to the discretion of the proposer, you should use double line spacing.

Thinking About the Target Audience

The target audience of the grant should be clearly explained in terms of demographic characteristics, size, and special characteristics or problems/challenges faced by the group. The project design should be developed in a manner that will effectively assist the target group in addressing those special problems or challenges. The disparity between the educational sophistication of the project and the educational naiveté of the audience (e.g., a software package which is primarily being used for research that is proposed to be used in a developmental mathematics class) is usually noted by the reviewers and can be one reason for declination of funding.

One of the goals of the Foundation is to increase the participation in science, technology, engineering, and mathematics of women, underrepresented minorities, and persons with disabilities. If your project is going to provide learning opportunities for women, underrepresented minorities, and persons with disabilities, explain exactly how this is going to be done. The proposal should explicitly identify components that will result in increased participation by and/or success of these groups. There must be a focused plan, explaining in detail how your project will accomplish this.

Building Coalitions

When several departments, several institutions, or constituencies outside the academic community are involved in the project, it is important to have these groups involved in the planning and to obtain letters of endorsement to the project.
When faculty or teacher enhancement activities or industry partners are included, involve these potential participants in the planning of project activities.

Where appropriate in terms of the project's size and its potential for national impact, consider designing the project with an advisory board of outside experts to provide

additional levels of expertise and experience and to help widely disseminate the project results.

Even in smaller projects, an advisory board of outside experts from the college or local community can provide additional levels of expertise and experience.

Build consensus on your idea within your own department and institution. If the courses are taught by different faculty members, reviewers may be more receptive if the proposal is submitted jointly by several members of the department or institution rather than by a single faculty member. It is often valuable to include a letter of endorsement from the department chair or other individuals to establish institutional support.

Include information about where the project fits in the context of the institution's academic program. As appropriate, show how your project is part of an overall plan to improve education by your institution and other institutions.

Discuss involving other organizations in your proposal either as partners in the endeavor or as test sites.

Other Considerations

Organize a good working team. Distribute duties and develop a firm schedule of activities needed to prepare the proposal in time to meet the proposal deadline.

Schedule proposal writing and information gathering activities over a reasonable time and carefully manage the schedule. Consider scheduling the writing in small, regular amounts of time. The effort needed to write a proposal might, at first sight, seem insurmountable. By proceeding a step at a time, you will be able to accomplish the task.

Remember to allow enough time to have the proposal revised by a third party if needed and to obtain all the necessary internal and external letters of endorsement and permissions. Consider having one person write the final proposal to assure consistency.

Typically a final version of a proposal will have gone through several drafts and revisions. Don't plan on writing a final version in a first draft.

Invest time running a pilot program and preparing preliminary versions of curricular materials prior to the actual writing of the proposal.

The proposal should be written so that, if funded, it can serve as a blueprint for executing the plan.