Office of Research
Services Offered

Our staff provides services ranging from identifying sources of funding to providing guidance on compliance and maneuvering the many hoops of project management. The following information is provided to inform faculty and students about the services we offer and the specific staff member to contact for each project-related question.

Please contact us at (931) 372-3374, research@tntech.edu, or www.tntech.edu/research for more information.
Note: Our administrators and staff are listed in the right margin. Staff are numbered to correspond to the respective service they provide.

Goals

- **Research:** Support, inspire, incentivize and further develop faculty to pursue sponsored research and grow a sponsored research portfolio along with the pursuit of scholastic achievements.
- **Innovation:** Develop and inspire innovation and an entrepreneurship culture on campus by involving students and faculty in collaborations with community and state agencies.
- **Economic Development:** Play a vital role in the economic development of the region, state of Tennessee, and the nation at large. **Share your R&D passion with us and let's work together to fulfill your career goals in R&D.**

A

Where do I find funding?
Funding Opportunities

Resources to Help You Locate External Funding Sources

▶ **SPIN Global Suite:** Includes a searchable database of over 40,000 funding opportunities from government and private funding sources as well as an email notification system related to funding opportunities aligned with saved searches. Visit https://www.tntech.edu/research/find-funding/spin-global-suite to set up an account.

▶ **Foundation Search:** Fully searchable online database of foundations containing funding history, preferences and contacts of over 100,000 foundations. There are a limited number of licenses available for this product, but Office of Research staff can run specific searches for faculty.

▶ **Grants.gov:** Single access point for more than 1,000 grant programs offered by all federal grant making agencies. Visit www.grants.gov.

▶ **Federal & Foundation Assistance Monitor:** Source for new public and private grant opportunities, policy news, and fundraising tips. https://www.tntech.edu/research/proposal-development-resources/

Ways We Help You Find Funding

- SPIN Global Suite training[4,6]
- Assist in the identification of funding sources[4,6]
- Communicate potential funding opportunities to appropriate faculty[4,6]
- Execute searches in Foundation Search[4,6]

Meet Our Staff

1. **Bharat Soni,** Vice President for Research and Economic Development, bsoni@tntech.edu, 372-3374

2. **Francis Otuonye,** Associate Vice President for Research, fotuonye@tntech.edu, 372-3374

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7. **Amy Hill,** Editor, amyhill@tntech.edu, 372-3464

8. **Jill Dicey,** Administrative Associate 3, jdicey@tntech.edu, 372-3897

9. **Budget and Financial Assistant**

B How do I get started?

Proposal Development & Submission

Resources to Help You Write & Submit Your Proposal

➤ **Research Development and Grant Writing News:** Provides monthly electronic newsletter for faculty on how to compete successfully for research and education funding from federal agencies and foundations. https://www.tntech.edu/research/proposal-development-resources/research-development-and-grant-writing-news

➤ **SharePoint Collaborative Software:** Provides work space for team members to collaborate on research ideas and proposal development. https://www.tntech.edu/its/its-tech-services/sharepoint/

➤ Submission through **Grants.gov**

➤ Submission through **FastLane**

➤ Submission through **NIH eCommons**

Ways We Help You Prepare & Submit Your Proposals

- Review funding program solicitation to identify key issues[6]
- Review proposal sections relative to evaluation criteria[6]
- Provide proofreading/editorial support[6,7]
- Provide graphic support[7]
- Assist with budget development[9]
- Review cost-sharing commitments[4]
- Provide training in proposal development[2,4,6]
- Assist with sponsor forms and electronic submission systems[4,6]
- Communicate with Principal Investigators regarding warning and errors as notified by the electronic system and agency[4,6]

C How do I manage the award?

Award Management & Compliance

Resources to Help You Manage Your Awards and Maintain Compliance

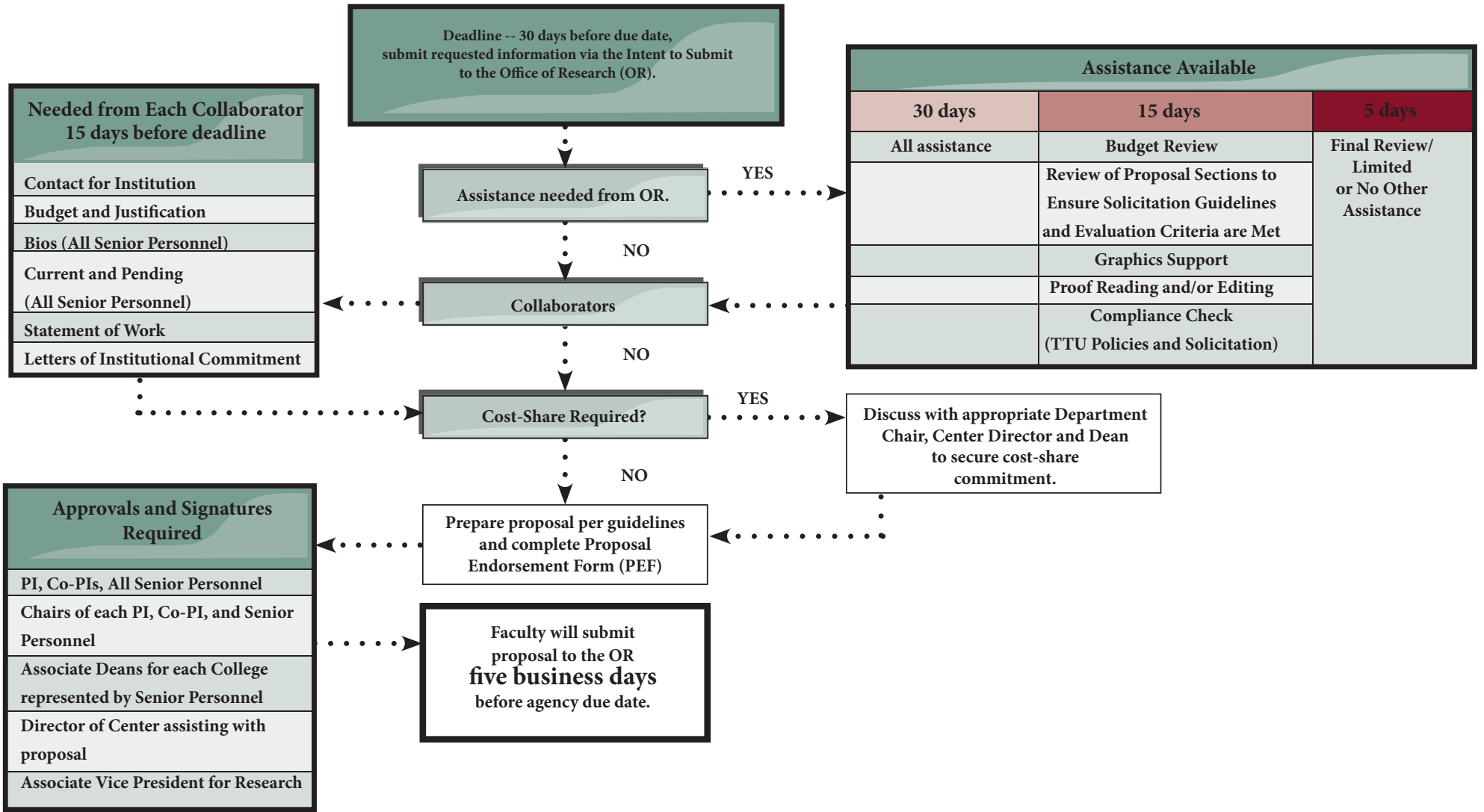➤ **Federal Regulations**, Tennessee Board of Regents, and TTU Policies and Procedures https://www.tntech.edu/research/policies

➤ **CITI training modules:** provide training in the Responsible Conduct of Research, Human Subjects, IACUC, and Export Controls. https://www.tntech.edu/research/training/

➤ **Relecura:** Online patent and portfolio analysis software for intellectual property (IP) creation, prior-art searches, research concepts, etc.

Ways We Assist You with Compliance

- Negotiate and execute agreements, contracts, and grants[2,5]
- Provide bookkeeping assistance on funded projects[9,10]
- Coordinate training for the compliance of agreements, contracts, and grants[5]
- Facilitates/initiates the protection of intellectual property and technology transfers[2,4]
- Provide oversight of patent prosecution[2]
- Institutional Animal Care and Use Committee (IACUC)[2,8]; Institutional Review Board for the protection of Human Subjects (IRB)[2,8]; Intellectual Property Advisory Committee[2,8]

931-372-3374

www.tntech.edu/research

We are here to help.

Office of Research Pathway to Proposals

Deadline -- 30 days before due date, submit requested information via the Intent to Submit to the Office of Research (OR).

Needed from Each Collaborator 15 days before deadline

- Contact for Institution
- Budget and Justification
- Bios (All Senior Personnel)
- Current and Pending (All Senior Personnel)
- Statement of Work
- Letters of Institutional Commitment

Assistance needed from OR. — YES →

NO ↓

Collaborators

NO ↓

Cost-Share Required? — YES →

NO ↓

Prepare proposal per guidelines and complete Proposal Endorsement Form (PEF)

Assistance Available

30 days	15 days	5 days
All assistance	Budget Review	Final Review/ Limited or No Other Assistance
	Review of Proposal Sections to Ensure Solicitation Guidelines and Evaluation Criteria are Met	
	Graphics Support	
	Proof Reading and/or Editing	
	Compliance Check (TTU Policies and Solicitation)	

Discuss with appropriate Department Chair, Center Director and Dean to secure cost-share commitment.

Approvals and Signatures Required

- PI, Co-PIs, All Senior Personnel
- Chairs of each PI, Co-PI, and Senior Personnel
- Associate Deans for each College represented by Senior Personnel
- Director of Center assisting with proposal
- Associate Vice President for Research

Faculty will submit proposal to the OR five business days before agency due date.

NSF MERIT REVIEW CRITERIA

NSF merit review criteria are listed below. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal and for which he/she is qualified to make judgments.

Criterion 1: What is the intellectual merit of the proposed activity?

- How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields?
- How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.)
- To what extent does the proposed activity suggest and explore creative and original concepts?
- How well conceived and organized is the proposed activity?
- Is there sufficient access to resources?

Criterion 2: What are the broader impacts of the proposed activity?

- How well does the activity advance discovery and understanding while promoting teaching, training, and learning?
- How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)?
- To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships?
- Will the results be disseminated broadly to enhance scientific and technological understanding?
- What may be the benefits of the proposed activity to society?

PIs should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to the above-described NSF merit review criteria. NSF staff will give these elements careful consideration in making funding decisions.

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students, and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- are essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Merit Review Broader Impacts Criterion: Representative Activities

Proposals submitted to the National Science Foundation are evaluated through use of two merit review criteria, which all proposals must address explicitly. Experience shows that while most proposers have little difficulty responding to the criterion relating to intellectual merit, many proposers have difficulty understanding how to frame the broader impacts of the activities they propose to undertake.

The examples provided below are organized by the set of potential considerations used in assessing the broader impacts of the proposed activity. They illustrate activities that, when successfully incorporated in a project description, will help reviewers and NSF program staff address the broader impacts criterion in the review and decision process.

The list is not intended to be exhaustive, nor is any particular example relevant to all proposals. Proposers can draw from the examples but are urged to be creative in their approaches to demonstrating the broader impacts of their projects. Proposers already undertaking similar kinds of activities should carefully consider how to link these examples to the research and education projects they are proposing for funding. Proposers also should consider what types of activities best suit their interests, while enhancing the broader impacts of the project being proposed.

The components of the broader impacts criterion as defined by the National Science Board are listed below. The list is followed by short sections on each component that provide background information and representative activities.

Advance Discovery and Understanding While
Promoting Teaching, Training and Learning

Background: Integration of research and education is one of "three core strategies that guide [NSF] in establishing priorities, identifying opportunities, and designing new programs and activities.... Effective integration of research and education at all levels infuses learning with the excitement of discovery and assures that the findings and methods of research are quickly and effectively communicated in a broader context and to a larger audience" (NSF GPRA Strategic Plan 2001 - 2006)

Examples of Activities:
- Integrate research activities into the teaching of science, math and engineering at all educational levels (e.g., K-12, undergraduate science majors, non-science majors, and graduate students).
- Include students (e.g., K-12, undergraduate science majors, non-science majors, and /or graduate students) as participants in the proposed activities as appropriate.
- Participate in the recruitment, training, and/or professional development of K-12 science and math teachers.
- Develop research-based educational materials or contribute to databases useful in teaching (e.g., K-16 digital library).
- Partner with researchers and educators to develop effective means of incorporating research into learning and education.
- Encourage student participation at meetings and activities of professional societies.
- Establish special mentoring programs for high school students, undergraduates, graduate students, and technicians conducting research.
- Involve graduate and post-doctoral researchers in undergraduate teaching activities.
- Develop, adopt, adapt or disseminate effective models and pedagogic approaches to science, mathematics and engineering teaching.

Broaden Participation of Underrepresented Groups

Background: One of NSF's five-year strategies is to "broaden participation and enhance diversity in NSF programs. At present, several groups, including underrepresented minorities, women, certain types of academic institutions, and some geographic areas are less than full participants in the science and engineering enterprise. NSF is committed to leading the way to an enterprise that fully captures the strength of America's diversity." (NSF GPRA Strategic Plan 2001-2006)

Examples of Activities:
- Establish research and education collaborations with students and/or faculty who are members of underrepresented groups.
- Include students from underrepresented groups as participants in the proposed research and education activities.
- Establish research and education collaborations with students and faculty from non-Ph.D.-granting institutions and those serving underrepresented groups.
- Make campus visits and presentations at institutions that serve underrepresented groups.
- Establish research and education collaborations with faculty and students at community colleges, colleges for women, undergraduate institutions, and EPSCoR institutions.
- Mentor early-career scientists and engineers from underrepresented groups who are submitting NSF proposals.
- Participate in developing new approaches (e.g., use of information technology and connectivity) to engage underserved individuals, groups, and communities in science and engineering.
- Participate in conferences, workshops and field activities where diversity is a priority.

Enhance Infrastructure for Research and Education

Background: The NSF Act of 1950 authorizes and directs the Foundation "to foster and support the development and use of computer and other scientific and engineering methods and technologies, primarily for research and education in the sciences and engineering;…"

"NSF investments provide state-of-the-art tools for research and education, such as instrumentation and equipment, multi-user facilities, ... telescopes, research vessels and aircraft, ... Internet-based and distributed user facilities, ... research networks, digital libraries and large databases." (NSF GPRA Strategic Plan 2001-2006)

Examples of Activities:
- Identify and establish collaborations between disciplines and institutions, among the U.S. academic institutions, industry and government and with international partners.
- Stimulate and support the development and dissemination of next-generation instrumentation, multi-user facilities, and other shared research and education platforms.
- Maintain, operate and modernize shared research and education infrastructure, including facilities and science and technology centers and engineering research centers.
- Upgrade the computation and computing infrastructure, including advanced computing resources and new types of information tools (e.g., large databases, networks and associated systems, and digital libraries).
- Develop activities that ensure that multi-user facilities are sites of research and mentoring for large numbers of science and engineering students.

Broad Dissemination to Enhance Scientific and Technological Understanding

Background: "NSF advocates and encourages open scientific communication. NSF expects significant findings from supported research and educational activities to be promptly submitted for publication.... It expects PIs to share with other researchers, at no more than incremental cost and within a reasonable time, the data, samples, physical collections and other supporting materials created or gathered in the course of the work. It also encourages grantees to share software and inventions . . . and otherwise to make the innovations ... widely useful and usable." (GPG; NSF 01-2a)'

Examples of Activities:
- Partner with museums, nature centers, science centers, and similar institutions to develop exhibits in science, math, and engineering.
- Involve the public or industry, where possible, in research and education activities.
- Give science and engineering presentations to the broader community (e.g., at museums and libraries, on radio shows, and in other such venues.).
- Make data available in a timely manner by means of databases, digital libraries, or other venues such as CD-ROMs.
- Publish in diverse media (e.g., non-technical literature, and websites, CD-ROMs, press kits) to reach broad audiences.
- Present research and education results in formats useful to policy-makers, members of Congress, industry, and broad audiences.
- Participate in multi- and interdisciplinary conferences, workshops, and research activities.
- Integrate research with education activities in order to communicate in a broader context.

Benefits to Society

Background: NSF is committed to fostering connections between discoveries and their use in service to society. The knowledge provided by NSF-funded projects offers a rich foundation for its broad and useful application. For example, projects may contribute to understanding the environment, commercial technology, public policy, health or safety and other aspects of the public welfare. (NSF GPRA Strategic Plan 2001- 2006)

Examples of Activities:
- Demonstrate the linkage between discovery and societal benefit by providing specific examples and explanations regarding the potential application of research and education results.
- Partner with academic scientists, staff at federal agencies and with the private sector on both technological and scientific projects to integrate research into broader programs and activities of national interest.
- Analyze, interpret, and synthesize research and education results in formats understandable and useful for non-scientists.
- Provide information for policy formulation by Federal, State or local agencies.

Collaborative Proposals

There are two types of collaborative proposals:

- A collaborative proposal from one organization; or
- A collaborative proposal from multiple organizations;

A collaborative proposal is one in which investigators from two or more organizations wish to collaborate on a unified research project. Collaborative proposals may be submitted to NSF in one of two methods: as a single proposal, in which a single award is being requested (with subawards administered by the lead organization); or by simultaneous submission of proposals from different organizations, with each organization requesting a separate award. In either case, the lead organization's proposal must contain all of the requisite sections as a single package to be provided to reviewers (that will happen automatically when procedures below are followed). All collaborative proposals must clearly describe the roles to be played by the other organizations, specify the managerial arrangements, and explain the advantages of the multi-organizational effort within the Project Description. PIs are strongly encouraged to contact the cognizant NSF Program Officer prior to submission of a collaborative proposal.

a. Submission of a collaborative proposal from one organization

The single proposal method allows investigators from two or more organizations who have developed an integrated research project to submit a single, focused proposal. A single investigator bears primary responsibility for the administration of the grant and discussions with NSF, and, at the discretion of the organizations involved, investigators from any of the participating organizations may be designated as co- PIs. Please note, however, that if awarded, a single award would be made to the submitting organization, with any collaborators listed as subawards. If a proposed subaward includes funding to support postdoctoral researchers, the mentoring activities to be provided for such individuals must be incorporated in the supplemental mentoring plan.

b. Submission of a collaborative proposal from multiple organizations

Simultaneous submission of proposals allows multiple organizations to submit a unified set of certain proposal sections, as well as information unique to each organization. The lead organization is required to submit a Project Summary, Project Description, References Cited, Data Management Plan, and Postdoctoral Mentoring Plan (if applicable) for all organizations in the collaborative. Other sections must be submitted by each organization in the collaborative. All collaborative proposals arranged as separate submissions from multiple organizations must be submitted via FastLane. For these proposals, the project title must begin with the words "Collaborative Research:". If funded, each organization bears responsibility for a separate award.

Required sections of the proposal differ based on the organization's role. The following sections are required for a collaborative proposal submitted by:

Lead Organization	Non-Lead Organization
• Cover Sheet	• Cover Sheet
• Project Summary	• Table of Contents (automatically generated)
• Table of Contents (automatically generated)	• Biographical Sketch(es)
• Project Description	• Budget and Budget Justification
• References Cited	• Current and Pending Support
• Biographical Sketch(es)	• Facilities, Equipment and Other Resources
• Budget and Budget Justification	
• Current and Pending Support	
• Facilities, Equipment and Other Resources	
• Data Management Plan	
• Postdoctoral Mentoring Plan (if applicable)	