

Department of Defense (DoD) National Defense Science and Engineering Graduate (NDSEG) Fellowship Program

The NDSEG Fellowship Program aims to cultivate a highly skilled workforce in science and engineering disciplines relevant to US national securityⁱ. By investing in Ph.D. students, the DoD seeks to foster innovative research and technological advancement, and to retain STEM talent within the U.S. Importantly, the DoD considers a wide range of disciplines to be “relevant to national security” beyond disciplines immediately connected to the military, and they regularly update the list of relevant topics (called “Broad Agency Announcements”—more below). The DoD specifically “encourage[s] applications from members of groups that historically have been underrepresented in science and technology.”ⁱⁱⁱ

As of 2024, Fellows receive a stipend of \$43,200 annually for the fellowship tenure, \$5,000 in professional development travel funds, and health insurance coverage offered through the Fellows’ institutions. The NDSEG also organizes an annual conference for Fellows to showcase their research, to network, and to connect with other DoD-sponsored researchers and groups.

Applying for the DoD NDSEG

In recent years, the NDSEG deadline has been in late October or early November.

Eligibility

- Applicants must be U.S. citizens or nationals.
- Applicants must have completed their undergraduate studies by September of the applicant year and have at least three remaining years in their graduate program (as a result, the NDSEG almost exclusively funds Ph.D. students).
- The applicant’s research should align with one or more specific topic within the Broad Agency Announcements.

Broad Agency Announcements (BAAs):

The BAAs are topic priority areas, and they span many fields in all STEM disciplines, including but not limited to: biotechnology, behavioral sciences, computer science, mechanical engineering, oceanography, political science, and space physics. The BAAs for each NDSEG-supporting agency (Air Force, Army, and Navy) can be found through [the NDSEG website](#). Note that the BAAs can change from year to year.

You must cite a BAA that aligns with your project in the application form. You are highly encouraged to cite that BAA within your research proposal (ideally, in the introductory section).

Application componentsⁱⁱⁱ and redaction:

The application consists of:

1. a proposal (which lists the project topic and relevant BAA)
2. a personal statement
3. a research proposal
4. three references (not letters of recommendation)
5. a Resume/CV.

Identifying information must be *redacted* from your application essays and CV. This includes your name, your advisor's name, co-authors' names, your institution, your geographic region, journal names, and award names. You can redact these pieces of information using "black" highlighter in MS Word, or you can replace them with general versions of the information (e.g. instead of "Yale" you could write "a research university").

Evaluation

Applications are evaluated in two phases. In the first phase, a panel of academic experts in your proposed research area will produce a list of top-ranked applicants based on merit (where "merit" is defined as both your past academic performance and the significance of the proposed research).

In the second phase, officials from sponsoring DoD agencies will select applicants whose research proposals align with their areas of interest (i.e. are likely to impact their own agency mission).

While the DoD does not specify specific NDSEG evaluation criteria, predoctoral research proposals are typically scored via some combination of *research significance/impact* and *research feasibility*.

Significance: Will this project help your field (and especially the agency with your identified BAA) move forward? You can demonstrate the significance of your project by:

- Clearly articulating a compelling "problem statement"—a real-world challenge in your field that relates to your specific research goals (see below for more on this).
- Clearly articulating what is already known about this topic and demonstrating that other groups are working on problems in this topic.
- Clearly articulating the expected outcomes of your proposed project, if successful, and how those outcomes would contribute to goals of the field and the target sponsoring agency.

Feasibility: Can this project be reasonably completed by you (a graduate student) in three years? You can demonstrate the feasibility of your project by:

- Having specific, clearly defined research goals and explaining what outcomes will signal that you achieved those goals. No one can solve a major research problem within three years, but you can solve a piece of the puzzle. Clearly explain what that piece is and how it fits into the bigger-picture research problem.
- Stating or showing that you have mastered key elements relevant to the project through previous experience or preliminary data.
- Explaining that you have the necessary resources (e.g., expertise of your lab, any relevant collaborators, any specialized equipment. But remember to redact identifying information!).

As with all fellowship applications, keep in mind that the reviewers are likely to *skim* your application materials, at least on the first pass. Aim to make your application materials skimmable:

- Break up sections with sub-headings
- Write topic and concluding sentences that summarize the main points of your paragraphs
- Use key phrases like "*the research objective is ...*" and "*in order to ... it is crucial to ...*"
- Use bold and italics to highlight key ideas
- Add spaces between paragraphs and include at least one figure to avoid the "wall of text" effect, which makes it harder to quickly identify key information.

Research Proposal

The proposal has a limit of three pages (including any figures), plus one page for citations. The NDSEG doesn't stipulate any specific organization for the research proposal, and successful proposals can take several forms. Try to model your proposal on typical proposal structures in your field (i.e., ask to see examples from mentors and peers, even if they aren't the NDSEG!).

In general, strong proposals include the following components:

Problem Statement / Significance

- Introduce and motivate a real-world challenge that relates to your project. This challenge will be on a larger scale than your specific research objective (see below), but your specific research objective will move us closer to solving the challenge.
- The challenge should also relate to one of the BAAs of an NDSEG sponsoring agency. Spell out that BAA and its connection to the challenge.

Background

- Outline the key pieces of scientific background information. This does not need to be comprehensive. Target the background information towards
 - The minimum information necessary to understand your project
 - Relevant details that demonstrate your solid understanding of the field
- Lead up to and clearly point out the specific *unknown* or *gap in the literature* that you will help fill by fulfilling your research goal.

Research Goal / Overall Objective

- Articulate a clearly defined research objective that can be achieved in 3 years.
- Given the applied nature of DoD's research priorities, emphasize the tangible outcome of achieving this objective—what will the field be able to do if you achieve this objective that it can't do now? Make sure this is relevant to your chosen BAA!

Research Objectives / Aims / Methods

- Segment your project into several steps, whether that be key steps that build on one another, or separate aims that address different aspects of the overall research goal.
- For any technique, material, or piece of equipment that you propose, explain it enough to be understood and justify that you'll be able to implement it.
 - The goal of describing your research approach is not to comprehensively outline the actual procedures, but rather to convince the reader that you know enough about this field to be able to implement the project. Let that guide the type and amount of detail you include. Also, explicitly state when you, your research group, or a collaborator has specialized expertise in the approach.
 - Get feedback from someone a little outside your field to gauge the right amount of detail for each component of your proposed project.
- For later stages of the project that involve optimization and many unknown variables, you can outline an example of how you could tackle that problem and explain how you will know whether your approach is working.
- Where possible, explain expected results and how you will know whether your specific research objectives are being met.

ⁱ <https://ndseg.sysplus.com/>

ⁱⁱ [DoDI 3218.02, July 24, 2013, Incorporating Change 2 on October 15, 2018 \(whs.mil\)](#)

ⁱⁱⁱ <https://ndseg.sysplus.com/NDSEG/Applicants/Application-Evaluation-Award>