Deadline: July 23, 2025

NSF 22-586: Faculty Early Career Development (CAREER)

Directorate of Engineering/Division of Engineering Education and Centers

Logistics

- Please stay muted unless you are speaking
- Use Zoom chat to submit questions during the lecture portion (live Q&A at the end)
- Use the ”reactions” > “raise hand” feature to ask a question live
- Real-time captions are available within Zoom

- The presentation slides and webinar recording, excluding Q&A, will be available on the RFE program description as soon as possible following the webinar.

Your NSF Engr Ed team

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NSF-ENG-EEC

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NSF-ENG-EEC

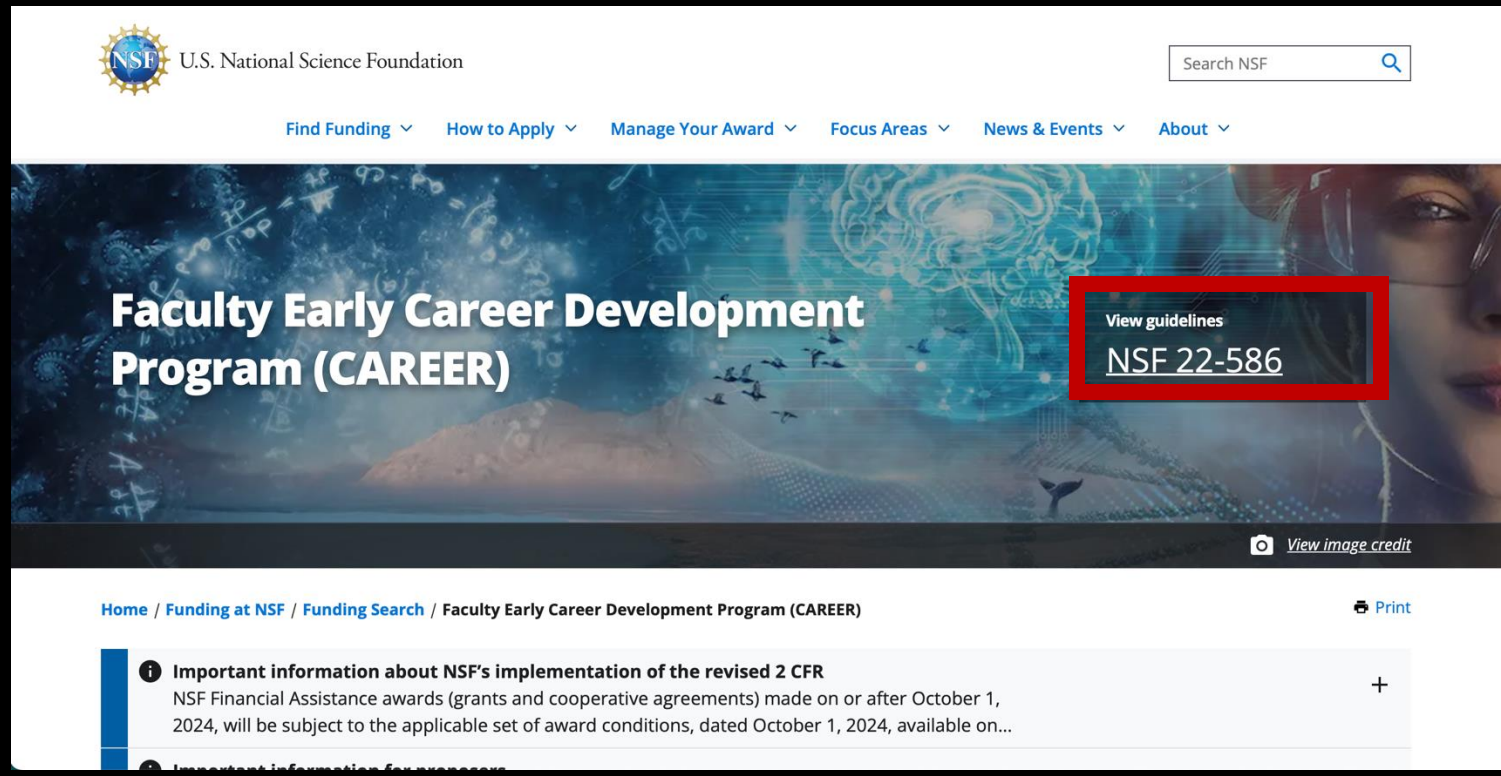
Email either of us at eer-programs@nsf.gov

Note

- Materials here supplement the general topic webinar, webinar on submission details, slides, and FAQ (NSF 22-100)
  - https://www.nsf.gov/funding/opportunities/career-faculty-early-career-development-program/updates/94708
  - https://bit.ly/NSF2025-CAREER
- Strongly recommend using research.gov over grants.gov (because of internal automated checks for compliance)
- Specific to Engineering Education (RFE: PD-1340) – not sure about BPE

CAREERs going to EEC-Engr Ed

- CAREER is agency-wide
- Directorate of Engineering
  - Division of Engineering Education and Centers
    - Engineering Education research cluster→ PFE
      - RFE: PD-1340
- "NSF 22-586" means
  - NSF = program solicitation (significantly deviates from PAPPG)
  - From 2022



Faculty Early Career Development (CAREER)

Goal: Support early career faculty who have the potential to:

- Serve as academic role models in research and education
- Lead advances in the mission of their department and organization

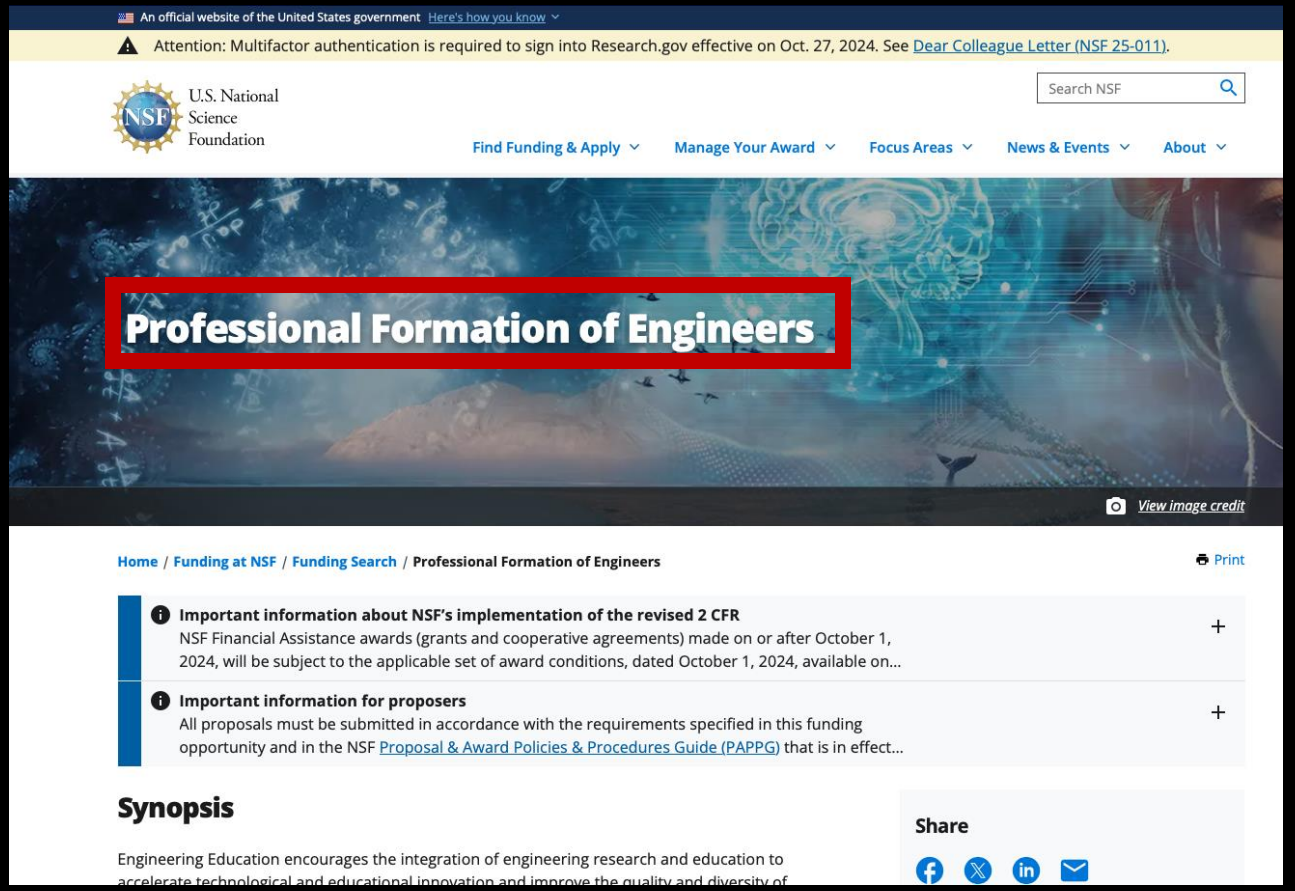
Agency-wide – so local norms apply – talk with your local program officer.

- In ENG/EEC/Engr Ed, proposals should focus on engineering education, ideally "PFE".

Say more about “PFE”…

Professional Formation of Engineers relates to:

1. The formal and informal processes and value systems by which people become engineers.
2. The ethical responsibility of practicing engineers to sustain and grow the profession.



What does NSF mean by "research"? (1)

"Common guidelines for educational research"

- Purpose
- Policy or practical significance
- Theoretical and empirical basis
- Project outcomes
- Research plan
- External feedback plan

Credit: Olga Pierrakos

Page 12 especially!!

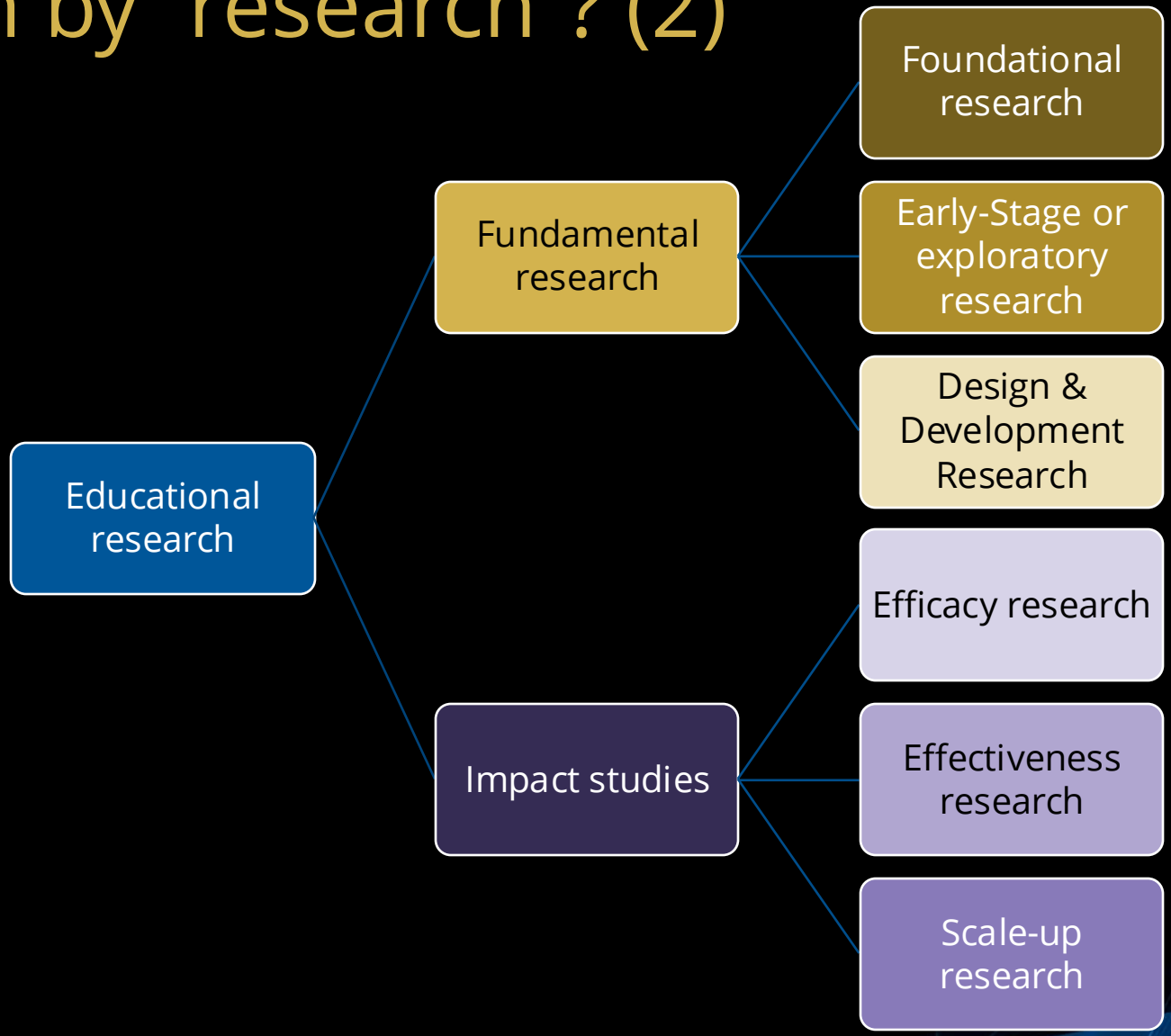
EDUCATION RESEARCH TYPE & GUIDELINES

Justification Guidelines	*Contributes to Core Knowledge*		*Develops Solutions*	*Contributes to Evidence of Impact*		
	1. Foundational Research	**2. Early State or Exploratory Research**	**3. Design & Development Research**	**4. Efficacy Research**	**5. Effectiveness Research**	**6. Scale-up Research**
Purpose	❑ Advance the frontiers of education and learning ❑ Develop and refine theory & methodology ❑ Provide fundamental knowledge about teaching and learning.	❑ Investigate approaches to education problems to establish the basis for design & development of new interventions or strategies, and/or provide evidence for efficacy study	❑ Develop new or improved interventions or strategies to achieve well-specified learning goals or objectives	❑ Determine whether an intervention or strategy can improve outcome under "ideal" conditions	❑ Estimate the impacts of an intervention or strategy when implemented under routine practice conditions	❑ Estimate the impacts of an intervention or strategy under conditions of routine practice and across a broad spectrum of diverse populations and settings
Policy or Practical Significance	❑ Specify and justify research problem(s) to be addressed ❑ Identify research questions	❑ Specify and justify practical education problem(s) or issue(s) to be addressed ❑ Details significance of knowledge to be generated	❑ Specify and justify practical education problem(s) or issue(s) to be addressed ❑ Describes significance & potential of the intervention or strategy	❑ Specify and justify practical education problem(s) or issue(s) to be addressed ❑ Describes significance & potential of the intervention or strategy	❑ Specify and justify practical education problem(s) or issue(s) to be addressed ❑ Describes significance & potential of the intervention or strategy	❑ Specify and justify practical education problem(s) or issue(s) to be addressed ❑ Describes significance & potential of the intervention or strategy
Theoretical and Empirical Basis	❑ Describe and justify theoretical & empirical bases ❑ Describe and justify relevant constructs	❑ Describe and justify theoretical & empirical bases ❑ Describe and justify relevant constructs	❑ Describe and justify theoretical & empirical bases ❑ Describe and justify theory of action or logic model	❑ Describe and justify empirical bases and empirical evidence	❑ Describe and justify empirical bases and empirical evidence	❑ Describe and justify empirical bases and empirical evidence of the support for the intervention or strategy
Project Outcomes	❑ Advance theory, methodology, & understanding of relevant constructs ❑ Include methodological rigor	❑ Include empirical evidence ❑ Specify conceptual framework or theoretical explanation ❑ Include methodological rigor	❑ Include design research ❑ Specify theory of action ❑ Describe design iterations and resulting evidence ❑ Describe empirical evidence and methodological rigor	❑ Detail study goals, design and implementation, data collection and quality, and analysis of findings ❑ Discuss implications of the finding for the theory of action or adjustments	❑ Detail study goals, design and implementation, data collection and quality, and analysis of findings ❑ Discuss implications of the finding for the theory of action or adjustments	❑ Detail study goals, design and implementation, data collection and quality, and analysis of findings ❑ Discuss implications of the finding for the theory of action or adjustments
Research Plan	❑ Describe hypotheses, research questions, and research objectives ❑ Detail study design, study population(s), sampling, methods for data collection, methods for data analysis	❑ Describe hypotheses, research questions, and research objectives ❑ Detail study design, study population(s), sampling, methods for data collection, methods for data analysis	❑ Describe methods for developing the intervention ❑ Detail methods for collecting evidence of feasibility and methods for obtaining pilot data (pilot study)	❑ Detail study design, key outcomes of interest for the impact study, setting(s) and population(s), sampling, methods for data collection, methods for data analysis ❑ Address reliability & validity	❑ Detail study design, key outcomes of interest for the impact study, setting(s) and population(s), sampling, methods for data collection, methods for data analysis ❑ Address reliability & validity	❑ Detail study design, key outcomes of interest for the impact study, setting(s) and population(s), sampling, methods for data collection, methods for data analysis ❑ Address reliability & validity
External Feedback Plan	❑ Include external, critical reviews of its design and activities ❑ Describe plan for continuous improvement of activities and findings	❑ Include external, critical reviews of its design and activities ❑ Describe plan for continuous improvement of activities and findings	❑ Include external, critical reviews of its design and activities ❑ Describe plan for continuous improvement of activities and findings	❑ Include external, critical reviews of its design and activities ❑ Describe plan for continuous improvement of activities and findings	❑ Include external, critical reviews of its design and activities ❑ Describe plan for continuous improvement of activities and findings	❑ Include external, critical reviews of its design and activities ❑ Describe plan for continuous improvement of activities and findings

What does NSF mean by “research”? (2)

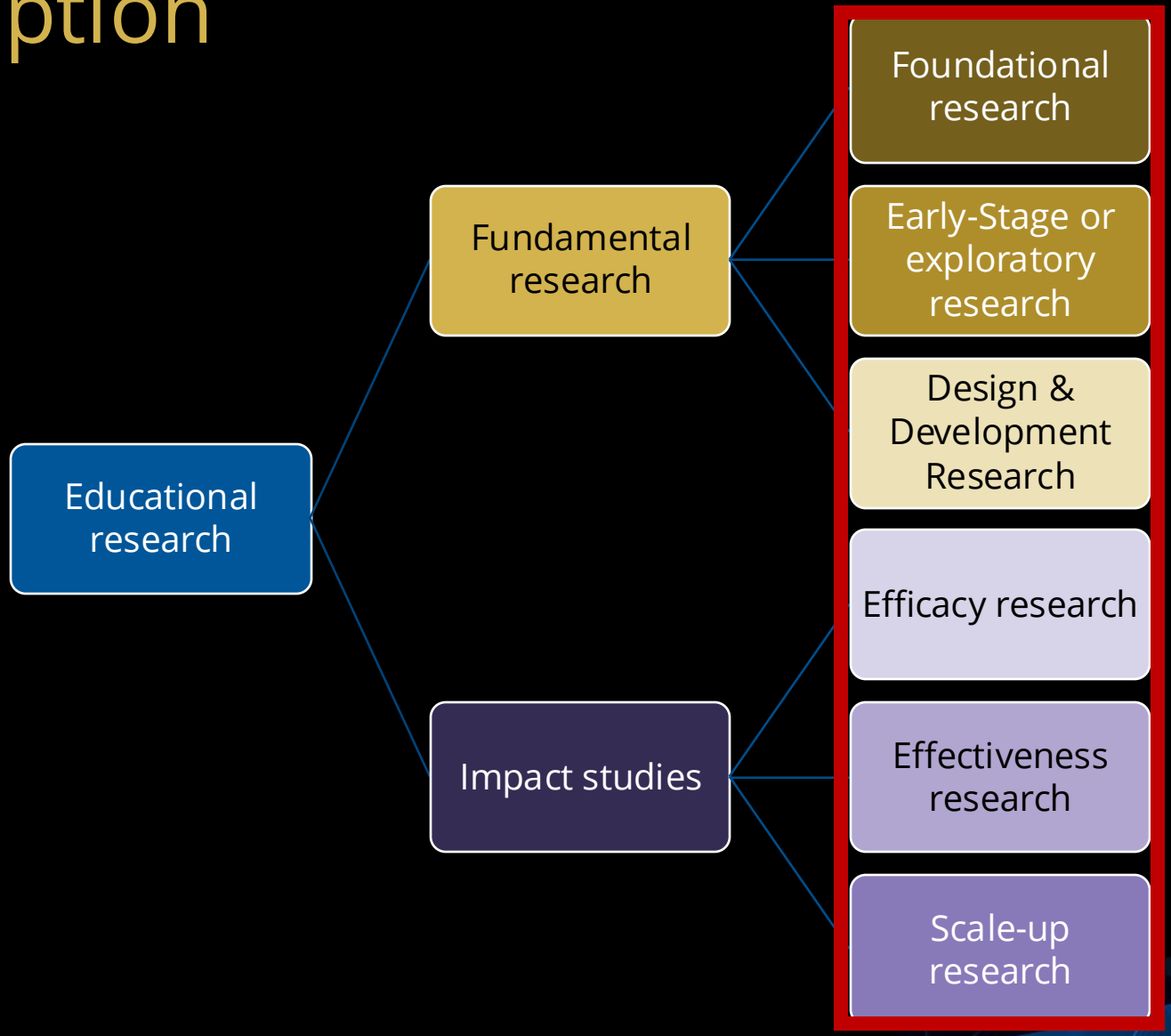
“Common guidelines for educational research”

- Purpose
- Policy or practical significance
- Theoretical and empirical basis
- Project outcomes
- Research plan
- External feedback plan



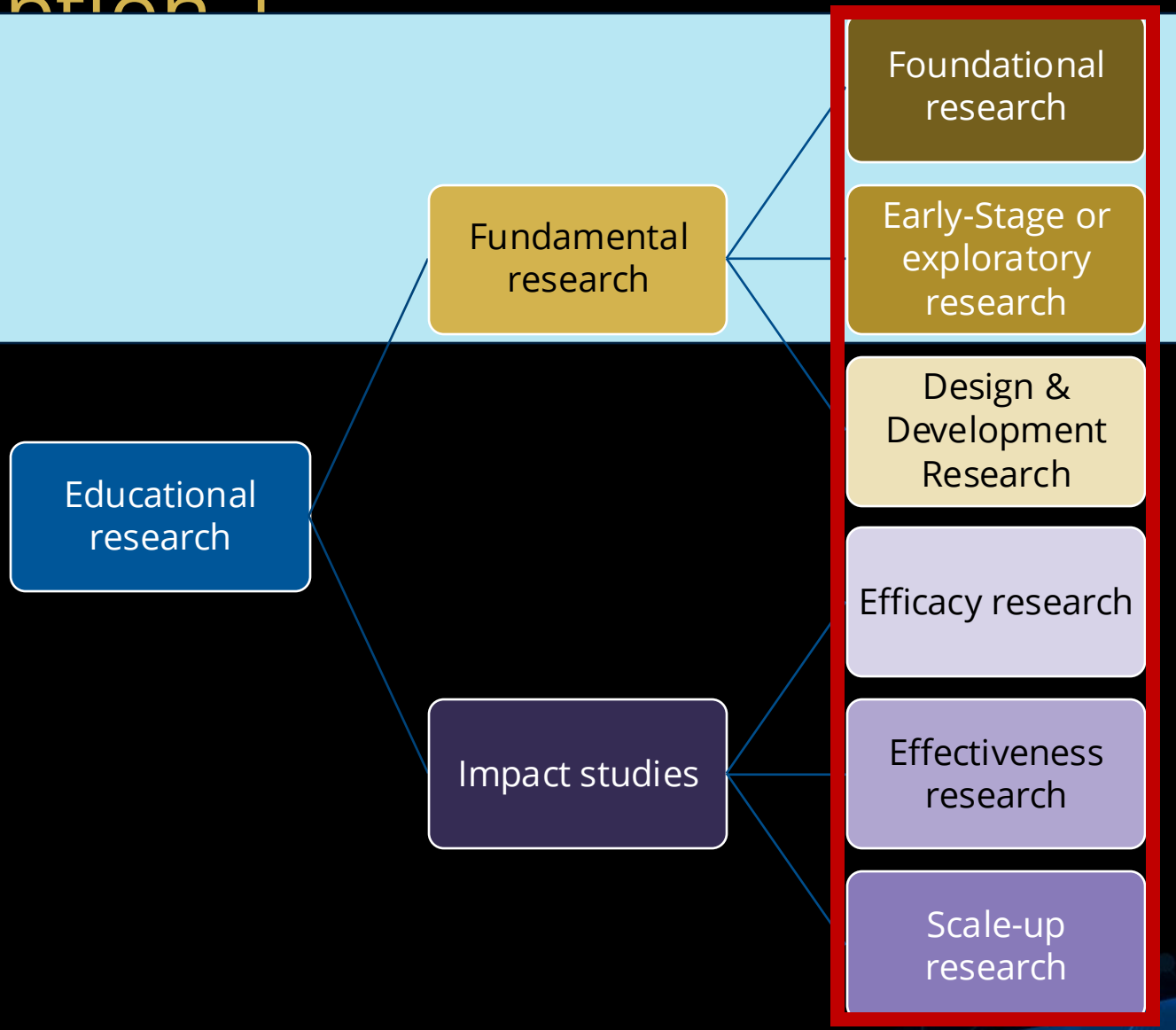
Page 12 especially!!

CAREER Engr Ed exception



CAREER Engr Ed exception 1

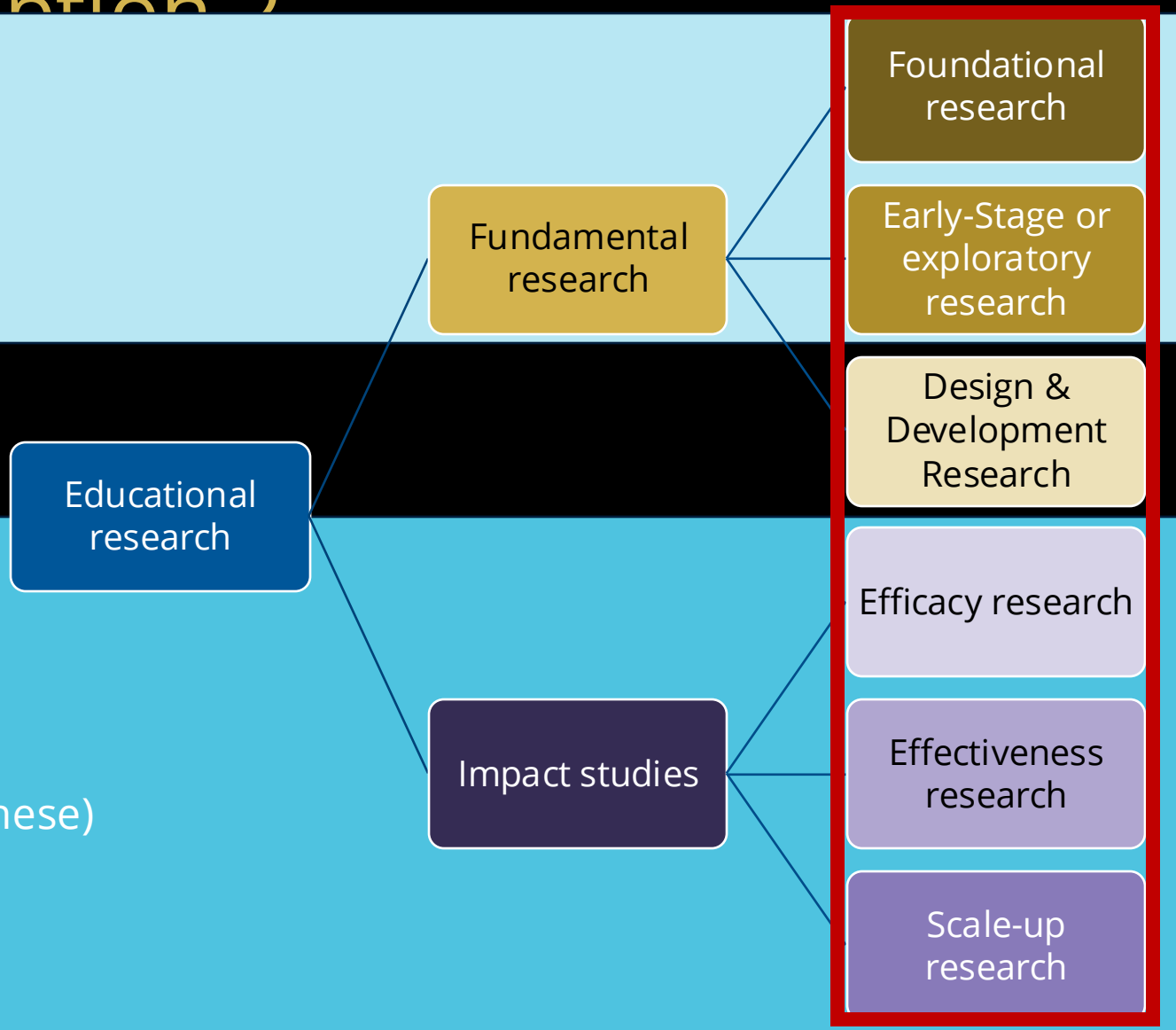
All possible participants relating to PFE



CAREER Engr Ed exception 2

All possible participants relating to PFE

All possible participants relating to PFE
(although reviewers not really expecting these)

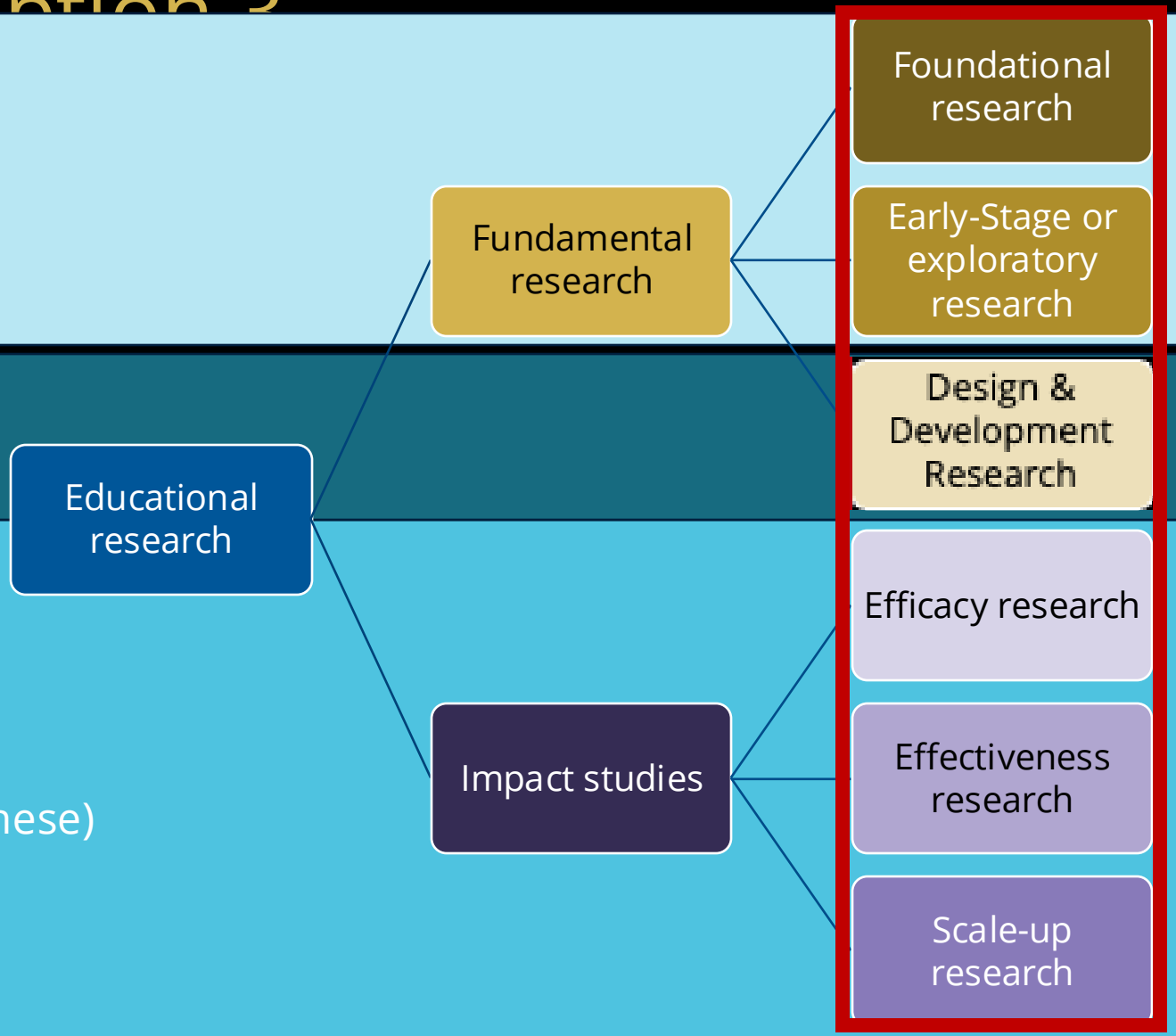


CAREER Engr Ed exception 3

All possible participants relating to PFE

All possible participants relating to PFE

All possible participants relating to PFE
(although reviewers not really expecting these)

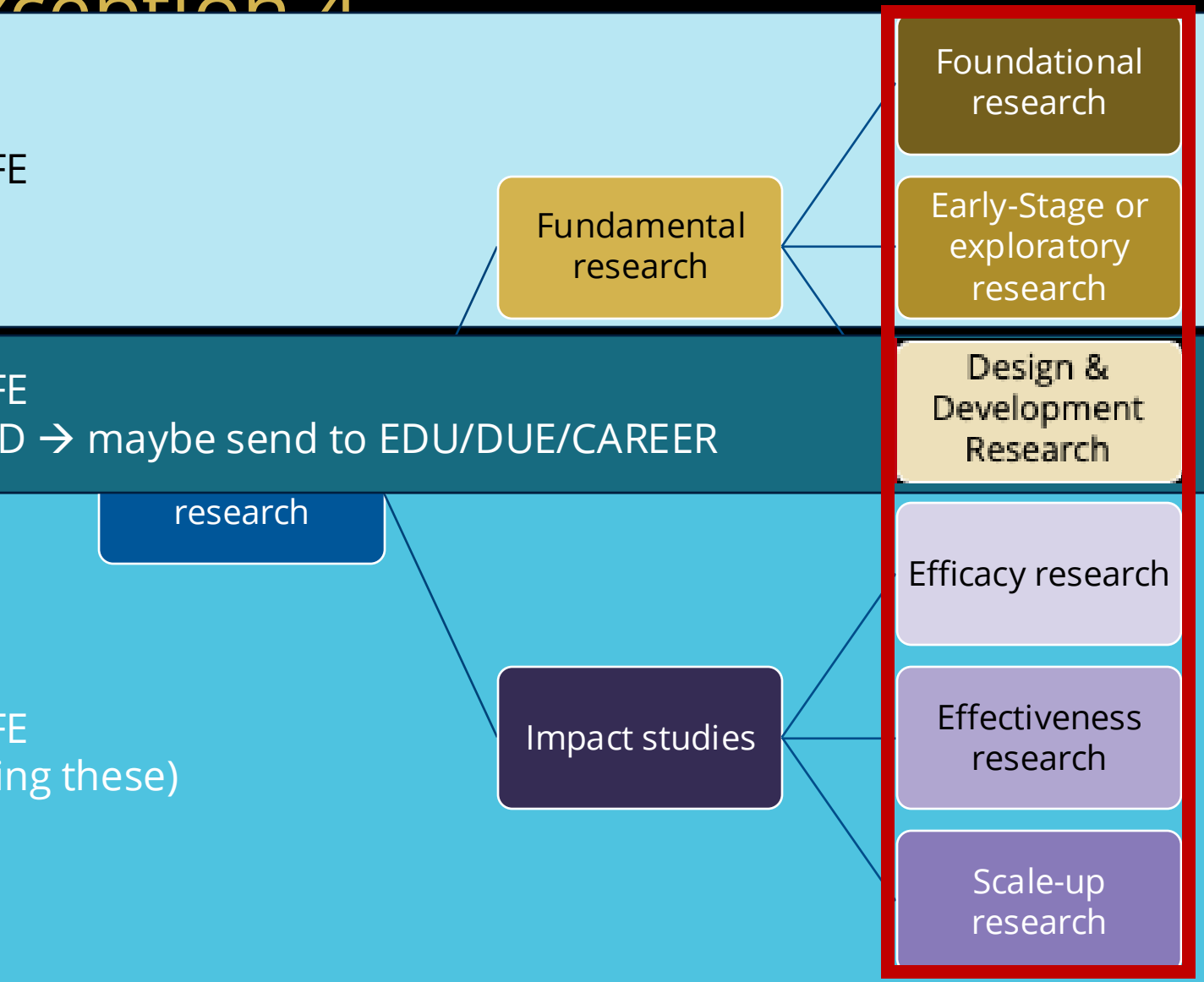


CAREER Engr Ed exception 4

All possible participants relating to PFE

All possible participants relating to PFE
EXCEPT – undergraduate D&D → maybe send to EDU/DUE/CAREER

All possible participants relating to PFE
(although reviewers not really expecting these)



What goes into proposals, usually? (1)

- PAPPG – “proposal contents”
  - https://www.nsf.gov/policies/pappg/24-1/ch-2-proposal-preparation#d-proposal-contents-171
- Cover sheet (automatically generated)
- Project summary (not an “abstract”; must include IM and BI explicitly described) – 1 p
- Table of contents (automatically generated)
- Project Description (15 p, we’ll come back to this)
- Reference cited
- Budget (produced by your sponsored programs people)
- Budget justification (you write, but use your SPS’s categories).

https://www.nsf.gov/policies/pappg

What goes into proposals, usually? (2)

- PAPPG – “proposal contents”
  - https://www.nsf.gov/policies/pappg/24-1/ch-2-proposal-preparation#d-proposal-contents-171
- Facilities, Equipment and Other Resources
  - No template. Should show reviewers you have the research tools and space to do what you propose to do.
  - Should describe contributions of unfunded collaborators
- Senior/Key Personnel Documents – per PI
  - Biosketch – use standard tool
  - Current & Pending – work with your SPS
  - Collaborators and other affiliations – so we avoid your COIs – helps to include any personnel from this proposal!
  - Synergistic activities – what relevant experiences do you have to show you will be able to do what you are proposing?

https://www.nsf.gov/policies/pappg

What goes into proposals, usually? (3)

- PAPPG – “proposal contents”
  - https://www.nsf.gov/policies/pappg/24-1/ch-2-proposal-preparation#d-proposal-contents-171
- Supplementary Documentation
  - Mentoring plan – if the grant would fund a graduate student or postdoctoral researcher. No template. (More in a minute.)
  - Data Management and Sharing Plan
    - ENG: https://www.nsf.gov/eng/data-management-plans
      - Products of research
      - Data formats and standards
      - Dissemination, access, and sharing of data
      - Reuse, redistribution and production of derivatives
      - Archiving of data.
    - Other considerations: IP, IRB, use of AI, who will maintain

https://www.nsf.gov/policies/pappg

What goes into proposals, usually? (4)

- PAPPG – “proposal contents”
  - https://www.nsf.gov/policies/pappg/24-1/ch-2-proposal-preparation#d-proposal-contents-171
- Single copy documents
  - Authorization to deviate from proposal requirements (like if you miss the deadline because of a hurricane.)
  - List of suggested reviewers, or reviewers not to include
  - Any proprietary information (not usually applicable here)
  - Proposal certifications by your institution (takes time – so build into your timeline for submission.)
    - Includes certification of “safe and inclusive working environments for off-campus or off-site research” which you can request to see
    - Includes proposal certifications from PIs/key personnel (certifying info is true in biosketch, C&P, and malign foreign talent recruitment programs)

https://www.nsf.gov/policies/pappg

Single copy: Mentoring plan (for postdoc/grads)

- For both postdoctoral researchers and graduate student researchers
  - Budget: B. Other Personnel or F. Participant Support Costs
- Limited to one page total
  - (even if both graduate students and postdoctoral scholars are on project)
  - Excess content can be included within Project Description page limit.
- Reviewed under the Broader Impacts criterion
  - Does the plan effectively address both research mentoring and broader career and professional development?
  - Will the mentoring activities support the development of skills and competencies needed for the proposed project? For the trainee's continuing professional growth?
  - Will the mentoring activities help grad students graduate and postdocs advance to their next career step?
  - Does the plan reference the annual use of Individual Development Plans (IDPs) for trainees receiving "substantial" support?

Research or Impacts on Tribal Lands

Proposals that may impact the resources or interests of a federally recognized American Indian or Alaska Native Tribal Nation (Tribal Nation) will not be awarded by NSF without prior written approval from the official(s) designated by the relevant Tribal Nation(s).

- Proposers seeking NSF funding for such proposals must… Include at least one of the following:
  i. a copy of the written request to the relevant Tribe(s) to carry out any proposed activity/activities that may require prior approval from the Tribal Nation(s);
  ii. written confirmation from the Tribal Nation(s) that review and approval is not required; or
  iii. a copy of a document from the relevant Tribal Nation(s) that provides the requisite approval.
- All such documentation must be uploaded into "Other supplementary documents" in Research.gov. If only (i) is provided, the proposer will still be required to submit either (ii) or (iii) before NSF will make an award decision.

Deviations from PAPPG

(where “silent,” refer to PAPPG)

Category	How it deviates from PAPPG
Deadline	**July 23 2025, at 5 pm, your institution’s time (are you traveling?)**
Title	Must start with ”CAREER”
Minimum cost	ENG: $500,000 No max BUT keep in mind the proposed budget Congress is considering
Timeframe	5 years • Not sure about the history of supplements continuing • Not sure about more than one no-cost extension (because of how we fund CAREERS and the money ”times out”)
PI restrictions	“early career” at the time of submission, no co-PIs, eligibility certified in department head LOS
Program description content	Gives a list of what to talk about
Requirements of letters of collaboration	Department letter with specific expectations Letters of collaboration that follow form.
Solicitation-specific review criteria	1 criterion relating to 2 goals
PECASE eligibility (optional)	US citizens/nationals/permanent residents at time of nomination

Project description requirements

- description of the proposed research project, including
  - preliminary supporting data where appropriate,
  - specific objectives
  - methods and procedures to be used, and
  - expected significance of the results;
- description of the proposed educational activities and their intended impact;
  - Note: and not be more research – instead, how putting what learned in the research into practice?
- description of how the research and educational activities are integrated or synergistic (to each other, to you as PI, to your institution);
- description of the other broader impacts, besides the education activities, that will accrue from the project; and
- results of prior NSF support, if applicable (with PAPPG limits)
- explicit sections on IM and BI

Proposal should integrate research and education

- Describe the reciprocal relationship between the proposed research and education activities, and how they may inform each other in their career development as both outstanding researchers and educators.
- Reflect the PI's own disciplinary and educational interests, and the needs/context of their organization
- Be ambitious but feasible in the 5-year project
- Have a budget consistent with the scope of the research and education activities.

What does this integration actually look like?

- What traditional engineering researchers will do:
  - Research questions about their technical area
  - Educational plan on how relevant audiences should learn about research findings
- What educational researchers often want to do:
  - Research questions situated in educational contexts
  - Educational plan is more research questions based around an educational intervention
- What there is money and time and expectations to do:
  - Educational component is about connecting the results of the research with the people who can put them into use out in the world.

Department letter – 2p max, specific goals

- Affirm that PI is eligible for CAREER
  - For NTT: PI's appointment is at an early-career level equivalent to pre-tenure status, has both research and educational responsibilities, appointment *expected* to last 5 years
  - What "try number" is this, out of your 3?
- Indicate your project activities are supported by and advance the educational and research goals of the department and the organization
- Indicate that the department is committed to your support and professional development
- Describe:
  - relationship between the CAREER project, the PI's career goals and job responsibilities, and the mission of his/her department/organization, and
  - How head will ensure the appropriate mentoring of the PI, in the context of the PI's career development and their efforts to integrate research and education throughout the period of the award and beyond.
- For joint appointments – should include both head's signatures

Merit Review Criteria

Why is this project worth taxpayers' investment?

Intellectual Merit (1)

"Encompasses the potential to advance knowledge."

What is your argument that this is worth taxpayers' investment?

- IM - It's a great idea, with a great plan, as evidenced by grounding in existing research, data, and norms

Intellectual Merit (2)

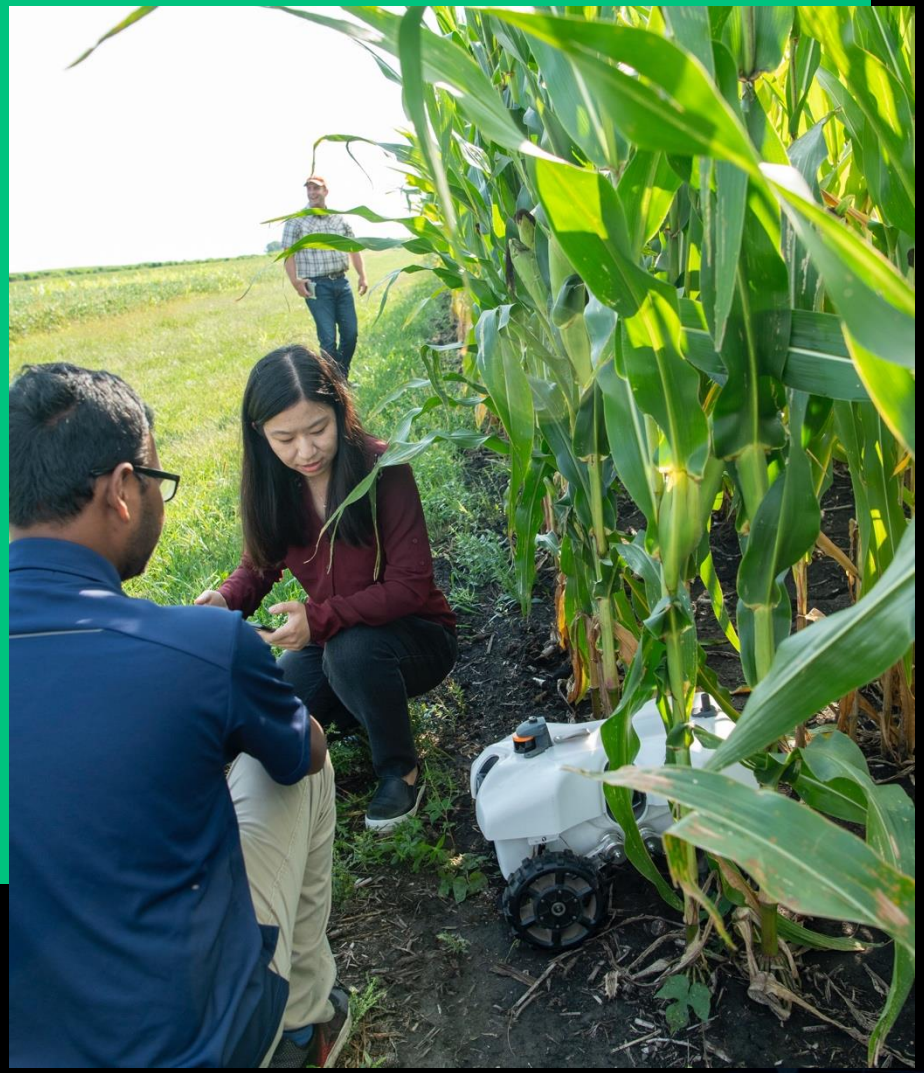
- Should this be done?
  - Will it advance knowledge and understanding?
  - Does it matter within the field and across fields?
  - Does it constitute creative, original, or potentially transformative research?
  - What is the significance of the expected contributions?
- Can this be done? (How well conceived and organized is the proposed activity?)
  - Soundness and feasibility of approach, evaluation, research plan given the resources requested and resources available at the institution
  - How qualified is the team to conduct the proposed research?
  - Will the team's plan curate data appropriately, mentor staff appropriately?
  - Does the team have access to necessary equipment and facilities?

Broader Impacts (1)

What is your argument that this is worth taxpayers' investment?

- BI – It will benefit society in specific, concrete ways.
  - Inclusion – broadening participation
  - Improve STEM education at any level
  - Increase public science literacy and engagement with STEM
  - Improving societal well-being
  - Developing a better global workforce
  - Build partnerships between academia and industry or others
  - Improve national security
  - Increase economic competitiveness
  - Enhance infrastructure for research and education

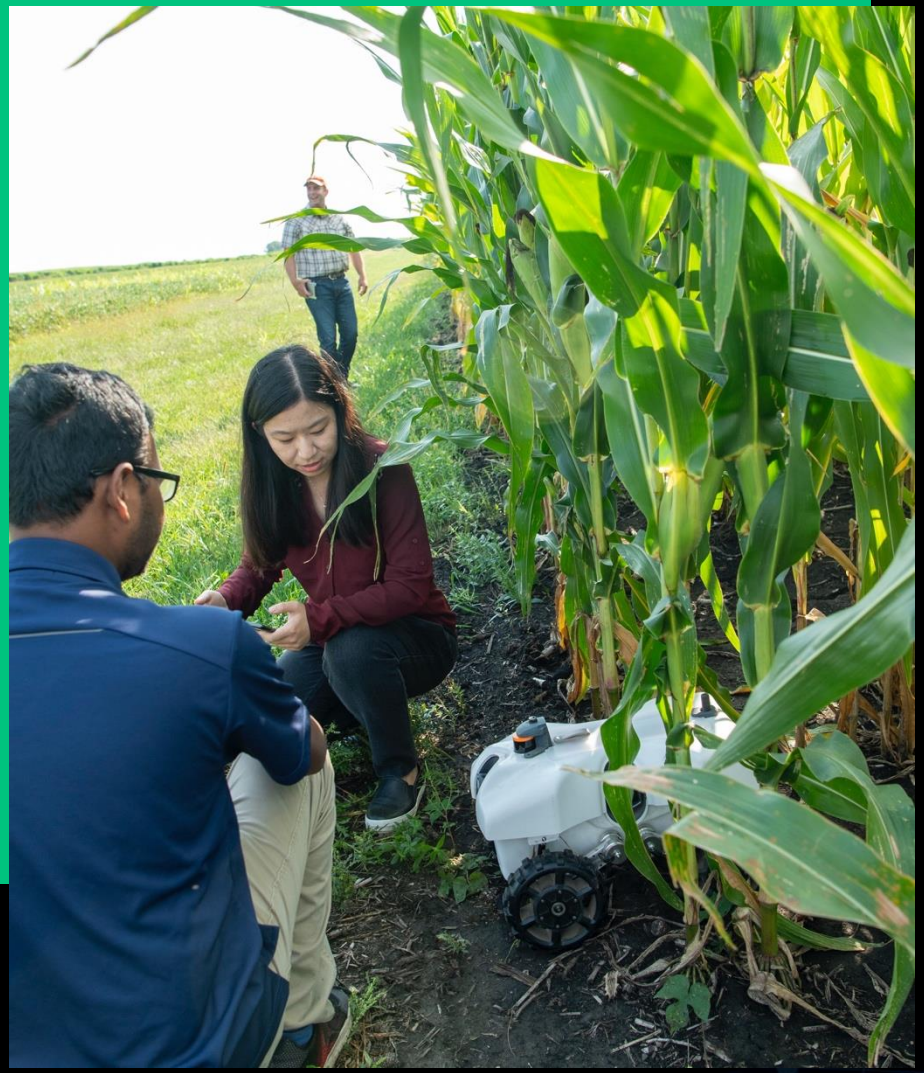
https://www.nsf.gov/funding/learn/broader-impacts



Broader Impacts (2)

Accomplished through

- the research itself;
- activities that are directly related to specific research projects (like postdoc/grad mentoring plan is evaluated as part of BI)
  AND / OR
- activities that are supported by, but complementary to the project.



Merit review criteria - summary

Intellectual merit

1. What is the potential for the proposed activity to advance knowledge and understanding within its own field or across different fields?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impact

1. What is the potential for the proposed activity to benefit society or advance desired societal outcomes?
2. To what extent do the proposed activities suggest and explore creative, original or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized and based on sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team or institution to conduct the proposed activities?
5. Are there adequate resources available to the principal investigator (either at the home institution or through collaborations) to carry out the proposed activities?

Merit review criteria – specifics (1)

Intellectual merit

1. What is the potential for the proposed activity to advance knowledge and understanding within its own field or across different fields?
2. Project summary; Project description
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impact

1. What is the potential for the proposed activity to benefit society or advance desired societal outcomes?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized and based on sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team or institution to conduct the proposed activities?
5. Are there adequate resources available to the principal investigator (either at the home institution or through collaborations) to carry out the proposed activities?

Merit review criteria – specifics (2)

Intellectual merit

1. What is the potential for the proposed activity to advance knowledge and understanding within its own field or across different fields?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. IM – literature/grounding
   Ex. How will research results be conceptually important to researchers re PFE?
   How is your research plan both innovative and grounded?
4.
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impact

1. What is the potential for the proposed activity to benefit society or advance desired societal outcomes?
2. To what extent do the proposed activities suggest and explore creative, original or potentially transformative concepts?
3. BI - literature/grounding; dissemination
   Ex. How will research results be concretely important to participants/other target audiences/your institution/PFE?
   How is your dissemination plan particularly impactful?
4.
5. Are there adequate resources available to the principal investigator (either at the home institution or through collaborations) to carry out the proposed activities?

Merit review criteria – specifics (3)

Intellectual merit

1. What is the potential for the proposed activity to advance knowledge and understanding within its own field or across different fields?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. I
5. A

Broader impact

1. What is the potential for the proposed activity to benefit society or advance desired societal outcomes?
2. To what extent do the proposed activities suggest and explore creative, original or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized and based on sound rationale? Does the plan incorporate a mechanism to assess success?

Project description: research design, timeline, plan for who is driving what.

Assess success: evaluation plan, evaluator, or advisory board (takes $$$)

Budget: participant incentives, PI time, evaluator resources (10%?), EEC PI meeting

Mentoring plan: will this help grad students and postdocs advance their careers as well as do the work you need done??

DMSP: are you working to find a way to share data, even qualitative data? Even with protections?

Merit review criteria – specifics (4)

Intellectual merit

1. What is the potential for the proposed activity to advance knowledge and understanding within its own field or across different fields?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5.

Broader impact

1. What is the potential for the proposed activity to benefit society or advance desired societal outcomes?
2. To what extent do the proposed activities suggest and explore creative, original or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized and based on sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team or institution to conduct the proposed activities?

Project description: Distribution of responsibilities, evaluation/advisory board description and plan, description of (your and their) expertise
PI team: prior NSF support, biosketches, synergistic activities

Merit review criteria – specifics (5)

Intellectual merit

1. What is the potential for the proposed activity to advance knowledge and understanding within its own field or across different fields?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3.
4.
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impact

1. What is the potential for the proposed activity to benefit society or advance desired societal outcomes?
2. To what extent do the proposed activities suggest and explore creative, original or potentially transformative concepts?
3.
4.
5. Are there adequate resources available to the principal investigator (either at the home institution or through collaborations) to carry out the proposed activities?

Are you asking for the right resources given what you're proposing?
Do you have what else you need, given what you're proposing and what is in budget?
Facilities and equipment: rooms necessary, library resources, computing and software resources, administrative support, secure data storage, open access publishing repositories etc, unfunded collaborators

Solicitation-specific criteria

Solicitation-specific criteria for CAREER

- Integration of research and education – reciprocal relationship between the proposed research and educational activities, and how they may inform each other in your career development as both outstanding researcher and educator
  - Remember that PFE is background expectation of reviewers

Transformative research

https://new.nsf.gov/funding/learn/research-types/transformative-research

- Challenges current understanding, or provides pathways to new frontiers in science and engineering
- Involves ideas, discoveries, or tools that do either or both:
  - Radically change understanding of an important existing concept in science, engineering, or education
  - Lead to the creation of a new paradigm or field of science, engineering, or education
- Can be/is often:
  - high risk, high payoff
  - challenge conventional wisdom
  - blurring disciplinary boundaries

Common mistakes

1. Submitting the wrong idea to this program

- Submitting interdisciplinary technical engineering research conducted in educational contexts
  - Ex: Robotics research that is brought into a course

- Keep in mind PFE.
- Include multiple potential homes when submitting your proposal
  - the first one is where the proposal gets automatically routed – PD-1340 for Engr Ed
- Talk with a program officer

2. Taking lots of space to tell the reviewers the wrong things

- Only talking about broader impacts waaaaaaaaay down the road
- Only describing the magnitude of problems nationally or globally (but not at their own institutions)
- Using boilerplate/recycled text in other/supplementary documents that describes things that have nothing to do with the proposed project
  - Facilities and equipment
  - Synergistic activities
  - DSMP
- In the explicit IM and BI sections, getting contributions in the wrong place, and missing obvious contributions.
  - Line them up with NSF's descriptions and questions!
  - Use the categories listed on the BI description page

3. Taking not enough space to tell reviewers the right things

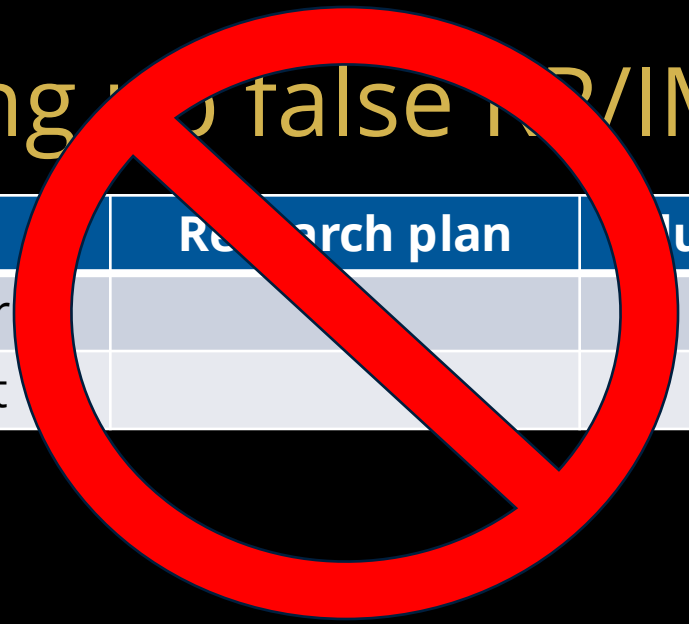
- What (specifically) are you going to do with the time and money you receive? When? Who is going to make sure it happens?
- Where are the plans/descriptions that the solicitation says are required?
- Who is going to care about the outcome of the research, and how are you going to make sure they know what you found out?
  - Do you go beyond "journal pubs and conference presentations" in your dissemination plan?
  - Is this the right mechanism to teach your audience the thing you found out?
    - (For example – do people really change their course designs or pedagogy because they read a paper of yours or came to your ASEE presentation? What is the research basis for how they do come to change what they do?)
- Help the reviewers …
  - answer the merit review questions!
  - tell NSF that this project meets NSF's mission, goals, priorities

4. Setting up false RP/IM and EP/BI alignment (1)

	Research plan	Educational plan
Intellectual merit	X	
Broader impact		X

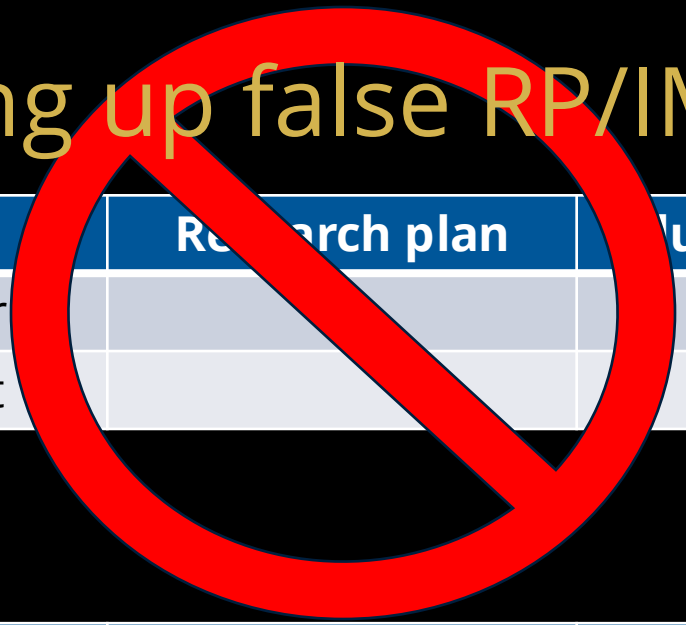
4. Setting up false NSF/IM and EP/BI alignment (2)

	Research plan	Educational plan
Intellectual merit		
Broader impact		X



4. Setting up false RP/IM and EP/BI alignment (3)

	Re arch plan	ucational plan
Intellectual mer		
Broader impact		X



	Research plan	Educational plan
Intellectual merit	X	X
Broader impact	X	X

Intellectual merit: Encompasses the potential to advance knowledge

Broader impact: Potential to benefit society and contribute to the achievement of specific, desired societal outcomes

5. Departmental letter is boilerplate

- Looks like all the other CAREER letters this chair is writing this round (or has ever written);
- Nothing is concrete – vague promises of non-specific “support”;
- What happens if this head leaves?

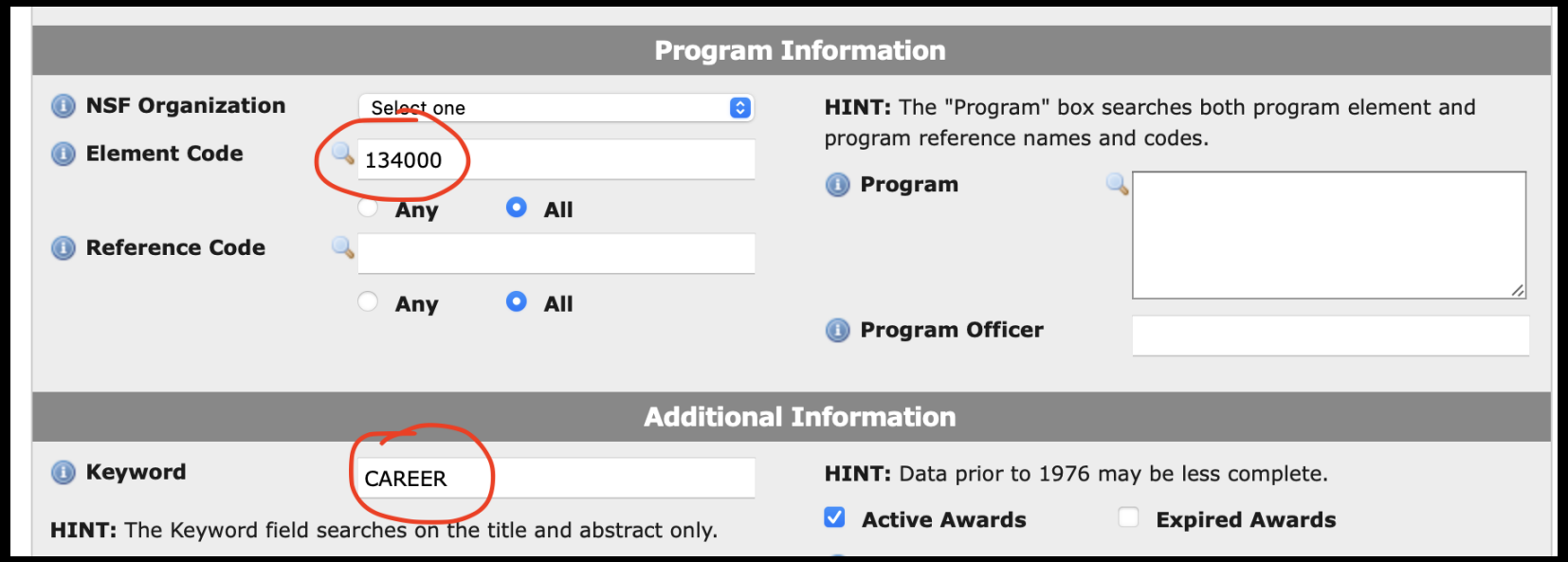
- The more tailored to you and your work, the better.
  - Check whether your head wants you to share notes, initial template or draft, etc.

Best practices

1. See what previous CAREER projects have done, and learn from them. (1)

Where to look:

- Public abstracts: Program Element Code (PEC) is “134000”, title includes “CAREER”



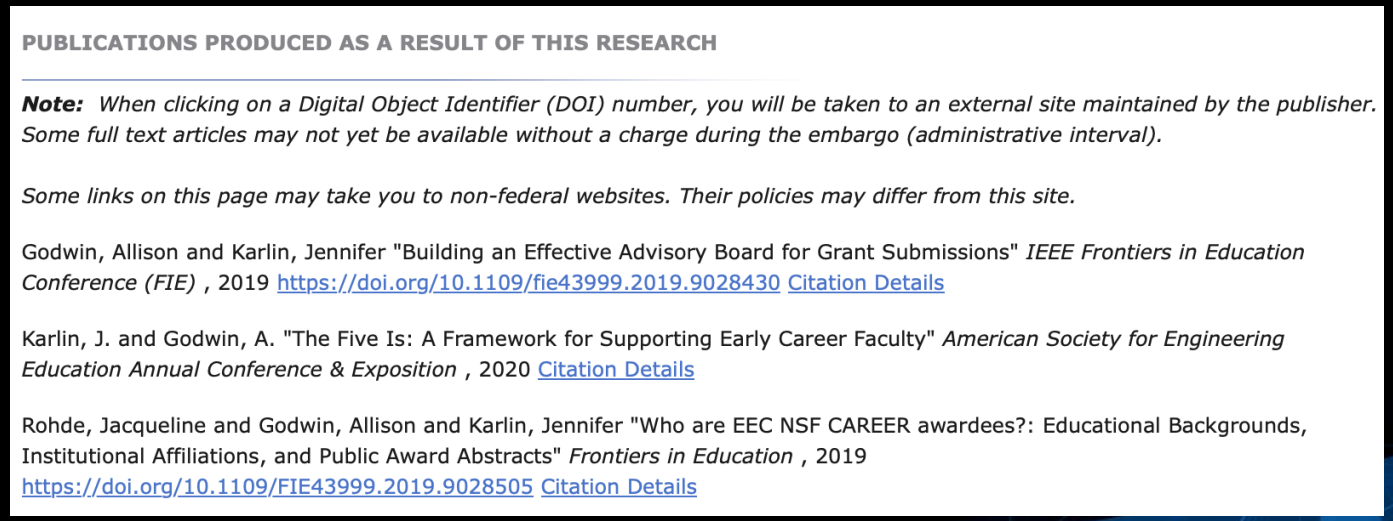
1. See what previous CAREER projects have done, and learn from them. (2)

Where to look:

- Public abstracts: Program Element Code (PEC) is “134000”, title includes “CAREER”
- Published papers should be in NSF’s PAR - ”Public Access Repository” – read and reference them in your proposal.
- ASEE papers are online at peer.asee.org.
- Publications related to NSF EEC-1837808 (EAGER - Godwin)

Email the PI and ask for a copy of the proposal (or just the program description).

Contact your program officer if you get stuck.



PUBLICATIONS PRODUCED AS A RESULT OF THIS RESEARCH

Note: *When clicking on a Digital Object Identifier (DOI) number, you will be taken to an external site maintained by the publisher. Some full text articles may not yet be available without a charge during the embargo (administrative interval).*

Some links on this page may take you to non-federal websites. Their policies may differ from this site.

Godwin, Allison and Karlin, Jennifer "Building an Effective Advisory Board for Grant Submissions" *IEEE Frontiers in Education Conference (FIE)* , 2019 https://doi.org/10.1109/fie43999.2019.9028430 Citation Details

Karlin, J. and Godwin, A. "The Five Is: A Framework for Supporting Early Career Faculty" *American Society for Engineering Education Annual Conference & Exposition* , 2020 Citation Details

Rohde, Jacqueline and Godwin, Allison and Karlin, Jennifer "Who are EEC NSF CAREER awardees?: Educational Backgrounds, Institutional Affiliations, and Public Award Abstracts" *Frontiers in Education* , 2019 https://doi.org/10.1109/FIE43999.2019.9028505 Citation Details

2. Make a page budget for your project description

Project description	15 pages. How to distribute?
proposed research project	
description of the proposed educational activities and their intended impact	
description of how the research and educational activities are integrated or synergistic	
description of the other broader impacts, besides the education activities, that will accrue from the project	
results of prior NSF support, if applicable	
content related to solicitation-specific criteria	
“How will you assess success?”	

2. Make a page budget - mistakes

Project description	15 pages. How to distribute?
proposed research project	Spends all the time here, but not enough on an actual plan.
description of the proposed educational activities and their intended impact	1 page on the course someone is going to revise based on research outcomes, no plan to assess impact
description of how the research and educational activities are integrated or synergistic	Trivial or embedded descriptions.
description of the other broader impacts, besides the education activities, that will accrue from the project	Focuses on the demographics of the research team. Focuses on the educational plan activities only. Overpromises - project will change the course of history.
results of prior NSF support, if applicable	Leaves out
content related to solicitation-specific criteria	Leaves out
“How will you assess success?”	Leaves out

2. Make a page budget – a better EXAMPLE

Project description	15 pages. How to distribute? (JUST AN ILLUSTRATION!!)
proposed research project	7 pages? Literature, clear obj, grounded methods, IM/BI explicit
description of the proposed educational activities and their intended impact	3 pages? Literature, clear obj, grounded methods, IM/BI explicit (see below)
description of how the research and educational activities are integrated or synergistic	signposted throughout; 0.5 page explicitly drawing attention to your expertise and career goals, to help reviewers with review.
description of the other broader impacts, besides the education activities, that will accrue from the project	0.5 page relating to NSF's list of broader impacts, of the research plan's Bis or integrated project's BIs
results of prior NSF support, if applicable	If lots: PAPPG limits – current, and in last 5 yrs. If none: say so.
content related to solicitation-specific criteria	Explicit section on career objectives, how you currently, and will, serve as role model, lead advances in mission of org, etc.
"How will you assess success?"	1-2 pages - External evaluator OR advisory board - with their expertise and plan, also in budget, biosketch/synerg. activities

3. Get the right colleagues involved.

(Research staff, external evaluator, advisory board members…)

- Do you have the right research expertise (EER, other)?
  - If not –submit to a different division, or apply for RIEF first
    - CAREER can have subawards, collaborators (including unfunded), but it's about your career trajectory
- Do you have the right broader impacts expertise?
  - If not, how will you get it? Or who will you put on your advisory board?
- Who do you want to connect with for the length of your career?
  - Potential tenure/promotion letter writers?
- Find a good evaluator, or advisory board member or two who have the expertise you need.
  - Fund them sufficiently. Ask for their advice on the research design.
  - Talk about the evaluation plan in the program description

4. Make sure to check the new NSF priorities and FAQs relating to the EOs (updated regularly)

- What has changed:
  - No specific activities or data collection (or research questions) focused on demographically-identified “protected groups”.
  - Broadening participation activities about providing access “to all Americans.”
    - Not limited to citizens, though.
- What hasn’t changed:
  - CAREER solicitation
  - Merit review criteria
  - The community of reviewers and what they care about
  - Who receives the award (your institution - and they have to be ok with what you’re submitting (as always).
  - Recruitment or outreach to groups that are not “protected” or identified by institution type or geographic location
- What about indirects? → FAQ directs to regular processes, not 15%-related processes
- If you are not sure if your idea meets the new agency priorities – set up an appointment with your program officer.

5. Ask your program officers questions

- Book us through our Bookings page or by emailing eer-programs@nsf.gov
  - https://bit.ly/NSF-EEC-EER
- Send a 1-page description of your idea before the meeting (include a description of how you plan to spend the money and time).
- Listen to our feedback, and please make revisions based on it.

Final thoughts

- NOTE THE TITLE REQUIREMENTS
  - Start the proposal title with “CAREER”
- Solicitations can change but NSF will provide notice well before deadlines.
- Grant-writing, grant management, and other resources available at the Engineering Education Community Resource: http://engineeringeducationlist.pbworks.com

Thank you!

Send questions to eer-programs@nsf.gov

We'll stop the recording, and move now to Q&A.

Links from the chat

Links from the chat (1)

- Solicitation: https://www.nsf.gov/funding/opportunities/career-faculty-early-career-development-program/nsf22-586/solicitation
- “Common Guidelines for Educational Research”: https://www.nsf.gov/pubs/2013/nsf13126/nsf13126.pdf
- PAPPG: https://www.nsf.gov/policies/pappg/24-1
  - Part I, Chapter II has the main “Proposal Preparation Instructions”: https://www.nsf.gov/policies/pappg/24-1/ch-2-proposal-preparation
- Link to SciENcv: https://www.ncbi.nlm.nih.gov/sciencv/
  - Also found in the PAPPG section on the “Senior/Key Personnel Documents” - https://www.nsf.gov/policies/pappg/24-1/ch-2-proposal-preparation#ch2D2h
- Engineering Education Community Resource:
  - http://engineeringeducationlist.pbworks.com/w/page/27578912/Engineering%20Education%20Community%20Resource

Links from the chat (2)

General webinar and information:

- https://www.nsf.gov/events/2025-nsf-career-program-informational-webinar/2025-05-19
- FAQ: https://www.nsf.gov/pubs/2022/nsf22100/nsf22100.jsp
- PFE: https://new.nsf.gov/funding/opportunities/professional-formation-engineers
- RIEF (just for PFE description: https://www.nsf.gov/funding/opportunities/pfe-rief-pfe-research-initiation-engineering-formation)
- IUSE: https://new.nsf.gov/funding/opportunities/improving-undergraduate-stem-education-directorate
- Link to CAREERs funded by EEC in the past: https://www.nsf.gov/awardsearch/advancedSearchResult?PIId=&PIFirstName=&PILastName=&PIOrganization=&PIState=&PIZip=&PICountry=&ProgOrganization=&ProgEleCode=134000&BooleanElement=All&ProgRefCode=1045&BooleanRef=All&Program=&ProgOfficer=&Keyword=&AwardNumberOperator=&AwardAmount=&AwardInstrument=&ActiveAwards=true&OriginalAwardDateOperator=&StartDateOperator=&ExpDateOperator=

Questions and answers from the chat

Is international travel allowed?

The PAPPG gives details on international travel here: (https://www.nsf.gov/policies/pappg/24-1/ch-11-other-post-award-requirements#f-international-considerations-e74).

Read the full details in the PAPPG, but in general, you do not need NSF permission for international travel unless your institution's policy requests that you get it.

The key restriction is that you have to use a US-Flag Air Carrier if possible.

For broadening participation proposals, is it necessary to format the proposal differently, for instance, should it be indicated in the title or summary?

- No. Engineering education research has always also included research on broadening participation, so if you would have normally submitted to BPE, you can just submit to Engineering Education instead, no other changes.

Are tenure-track faculty eligible to apply for CAREER?

- Yes.

There should be only one PI, who must be a tenure-track faculty, right?

- There must be only one PI, no co-PIs, but the PI doesn't need to be tenure-track. Check the solicitation for the full list of criteria for non-tenure-track faculty.
- Does this include teaching faculty?
  - You need to have both research and teaching as part of your job, but check the solicitation for the specific values.
- Does this include who are promoted to a Senior Lecture / Associate teaching professor, are they eligible to apply?
  - You need to be untenured as of the date of submission. If tenure is not available to you, look at the list of criteria in the solicitation, and you and your department head should discuss why you should still be considered "early career."

Is it ok to focus on geographic needs for a particular education program, for example, rural-focused education?

- Yes.

On research.gov, to submit to EEC, is it ENG —> EEC —> PFE/RED? That's the only thing I found for PFE. There is another one that says EngEd. I want to make sure I am listing the correct program. Thanks!

You should submit to the other one - you want the "Engineering Education" one. It might say RFE, it might say 1340 somewhere…