

Departmental BPC Plan Workshop

August 6-7, 2020



Welcome Session

Burçin Tamer
Computing Research Association



Background

- Providing support to develop meaningful BPC plans
- BPCnet.org
- Workshop at UIUC (November 2019)
- New workshop series
 - July 13-14 (virtual)
 - August 6-7 (virtual)
 - Fall 2020 (virtual?)
 - July 2021 at Snowbird

July 13-14 Workshop

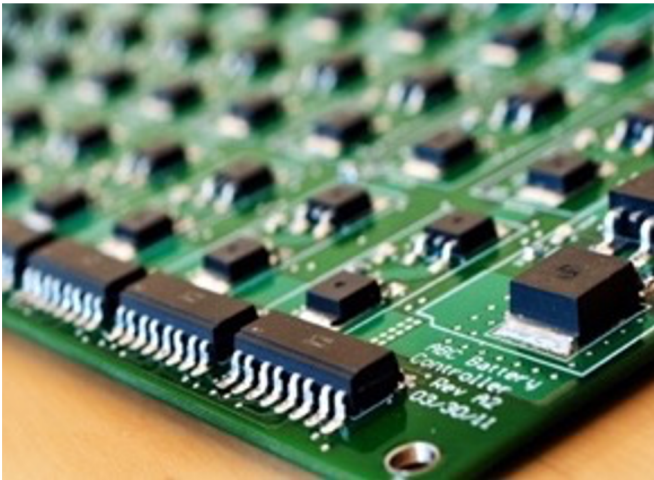
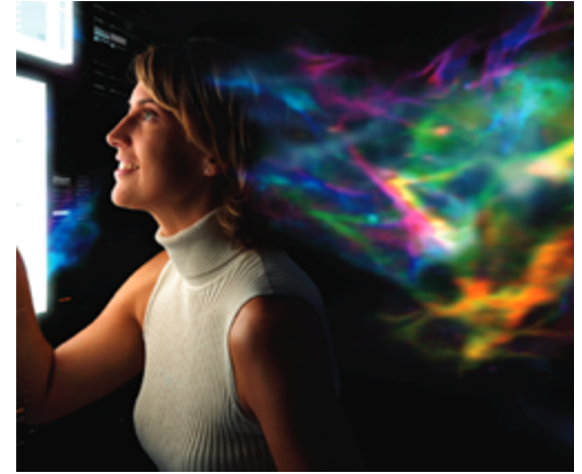
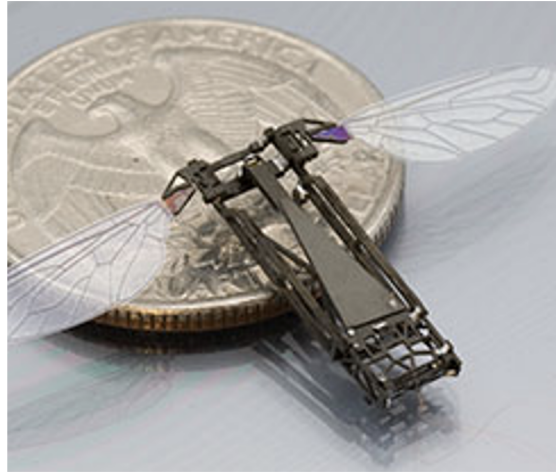
- Had a great time! Learned a lot!
- 38 institutions, 45 departments, 90 participants
- Participants' understanding of the BPC Plans
 - **Before the workshop:** Everyone → “moderately well” or below
 - **After the workshop:** Everyone → “moderately well” or above!



Overview of CISE and BPC Plans

National Science Foundation





NSF CISE Intro

Margaret Martonosi

NSF Assistant Director for Computer and Information
Science and Engineering (CISE)

July, 2020



Thanks!

- BPC Plan Workshop Series Steering Committee:
 - Nancy Amato, Colleen Lewis, Tracy Camp, Ronald Metoyer, Mary Hall
- NSF: Jeff Forbes, Allyson Kennedy, Jill Denner, Michelle Rogers
- Burçin Tamer, Heather Wright, and others at CRA as hosts
- Many more contributors to this effort and to these workshops
- All the Workshop Attendees committed to moving the needle on BPC Efforts

- Women: 20.3% of US CS PhD graduates
- African-Americans, Hispanics, Native Americans: 3.1 % of US CS PhD graduates

=> CS is missing ~70% of US population's talents.

CISE is committed to fostering the careers of a diverse set of researchers.

<https://cra.org/2019-taulbee-survey/>



Vision: Broadening Participation in Computing

- Goal: Move the needle on diversifying the CISE Research Community
- How?
 - Engage everyone
 - Partnerships between BP experts and broader CISE community
 - Currently in Year 2 of 3-year Pilot

BPC Activity Library

Increase your understanding of, interest in, and engagement with BPC activities.

[VIEW BPC ACTIVITY LIBRARY](#)

Write a Departmental BPC Plan

Guidance on writing a Departmental BPC Plan for approval by BPCnet.org.

[CLICK HERE](#)

What should a Department BPC Plan include?

Think Broadly!

- Yes, students in your labs.... What else?
- Work on inclusive classrooms
- Survey and improve on faculty climate. Consider annual public reports of departmental diversity and climate metrics
- COVID-19 and related events: Disproportionate impacts and mitigating responses?
- Commit to tracking data to inform policies:
 - Demographics of grad/ugrad applications and admissions.
 - Year by year retention in program
 - Post-grad trajectories 5-10 years out

Broadening Participation in Computing Plans



Jeff Forbes
NSF CISE Education & Workforce

Thanks to CISE colleagues!

- Margaret Martonosi
- Erwin Gianchandani
- Gurdip Singh
- Ken Calvert
- JD Kundu
- Thyaga Nandagopal
- Jill Denner
- Allyson Kennedy
- Fay Cobb Payton
- Michelle Rogers
- Becky Shearman



NSF CISE Definition of Underrepresentation

“CISE strongly encourages meaningful actions that address the longstanding underrepresentation of various populations — including:

- women,
- African Americans,
- Hispanics,
- American Indians,
- Alaska Natives,
- Native Hawaiians,
- Native Pacific Islanders, and
- persons with disabilities

— in the computing field.”

<https://www.nsf.gov/cise/bpc/>

Motivation for the BPC Pilot

“It will take more than good intentions or business as usual, however, to reverse longstanding underrepresentation. **It will take committed, focused, and sustained efforts on the part of many in the computing community.**”

- CISE AC BP Strategic Plan (2012)

Motivation for the BPC Pilot

“CISE will address BP programmatically both through focused activities and through **the inclusion of BPC efforts as an accepted and expected part of its research and education award portfolios.**”

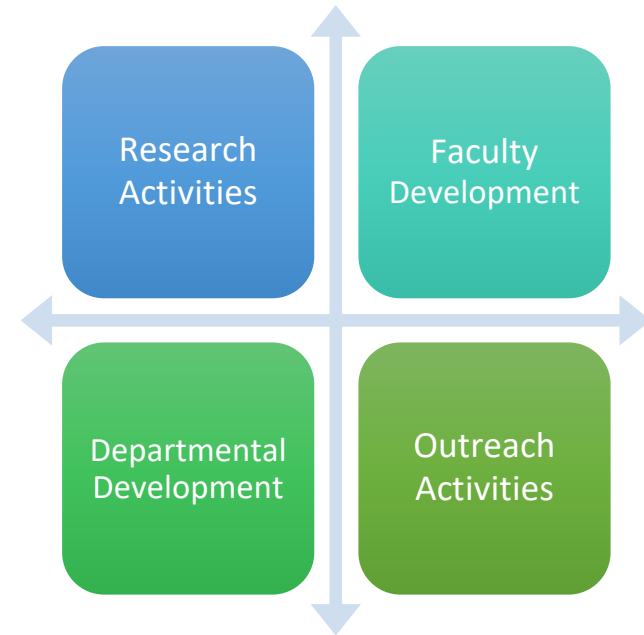
- **CISE AC BP Strategic Plan (2012)**

- **How do we effect change?**
 - **Requirements:** Require meaningful BPC activity in an expanding set of CISE Programs
 - **Support:** Provide resources and support for PIs & Reviewers
 - **Review/Report:** Provide feedback on all BPC plans submitted, and require reporting of BPC outcomes in annual reports of awarded projects

Vision:

BPC embedded in CISE Research Community

- **CISE research proposals include a meaningful plan to broaden participation in computing**
- Quality of plans improve; amount of reviewer feedback needed declines
- Plans are implemented; lessons learned from implementation are shared
- BPC working group monitors and supports progress of BPC
- Collaborations increase between CISE and other PIs with BP expertise
- **Measurable progress towards diversifying the CISE Research Community**





CRA-WP

Computing Research Association
Widening Participation



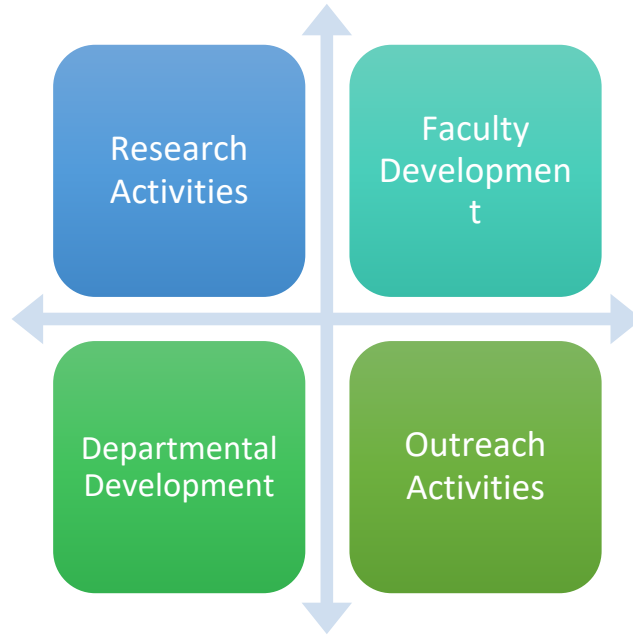
[Partner with DREU to host two REU students each summer](#)

[Analyze Retention Data for the CMD-IT University Award](#)



CMDiT

Fostering Innovation Through Inclusion



[NCWIT 101 - Learn about BPC](#)

[Volunteer to Teach CS in a Girl Scout Troop](#)



girl scouts

NSF CISE BPC Alliances

- Long-term experience engaging in BPC activities at scale



- Other resources:



CRA-WP

Computing Research Association
Widening Participation

REAL-CS

Researching Equity, Access,
& Learning in CS Education

Lessons Learned

- **Key Takeaways:**

- Ideal BPC plan describes an evidence-based, sustained response to a well-articulated aspect of broadening participation
- Many CISE PIs, especially those new to BPC, will not initially be in a position to develop or execute such an ideal plan



5 elements of a meaningful BPC plan

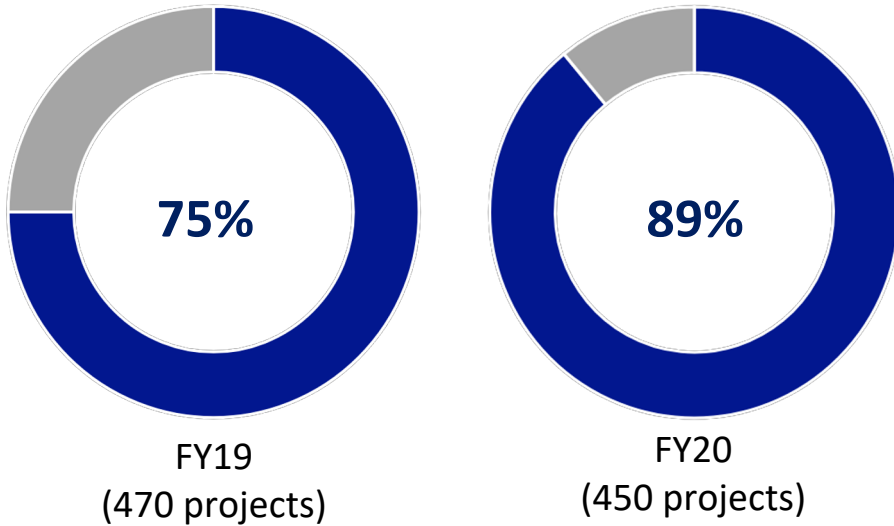
- **Context:** Describes the problem the plan addresses using institutional or local data; and the goals of the proposed activities
- **Intended population(s):** Specifically identifies the demographics of the participants, including underrepresented group and school level (ex. African American undergraduates or female high school students)
- **Strategy:** Outlines the plan of **activities** with specific intended outcomes, corresponding to the elements in (1) and (2) and with a role for each PI and co-PI.
- **Preparation:** Describes any past engagement with BPC activities and/or intended preparation/training activities to implement proposed work
- Plans for the **measurement** of outcomes for the proposed activities.

Individual BPC Plan - Review Strategy

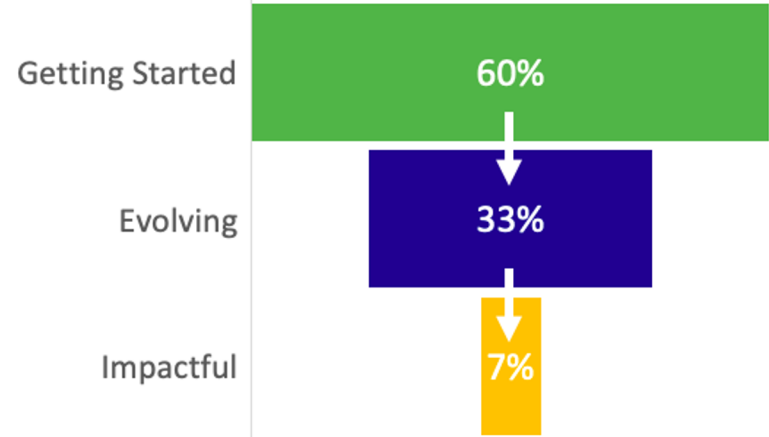
- **FY 2019-2021:** BPC plans required by time of award in Medium and Large proposals submitted to core programs, CPS, and SaTC
 - “PIs of Medium and Large proposals are therefore strongly encouraged consider this eventual requirement as they develop their proposals and include one- to three-page descriptions of their planned BPC activities under Supplementary Documents in their submissions. **Feedback will be provided on such plans.**”
- **Goals:**
 - Educate CISE community on the elements of an effective BPC plan
 - Provide *high-quality* feedback on submitted BPC plans
- **Process overview:**
 - BPC Experts review plans prior to CISE Core panels
 - CISE Reviewers use BPC reviews to inform discussion
 - BPC PLAN DOES NOT AFFECT OVERALL RATING OR AWARD RECOMMENDATION
 - Projects must have *meaningful* BPC plan at the **time of award**

Ongoing Assessment of BPC Pilot

Percentage of Projects including a BPC Plan



Stage of Development for FY20 BPC Plans



BPC Pilot Questions:

- How are Program Officers using the BPC reviews and what supports do they need?
- What resources are needed to improve plans?
- What are the challenges and opportunities for BPC within the CISE community?

Common Pitfalls of BPC Plans

1. Missing roles and responsibilities for each PI
2. Missing metrics that will be reported in the annual report
3. No demographics of intended population were provided
4. Not building upon best practices & existing efforts
5. Confusing *Broader Impacts* and *Broadening Participation*
6. Enumerating the PhD students who identify as underrepresented in computing without identifying the total number of students mentored or the recruiting and mentoring strategies that will be used

Institutional Efforts to address BPC

- Encourage units to develop their own Departmental BPC Plans to which their faculty can contribute
 - Enable *sustained* cultural change & *assessment* of impact

NSF BPC FAQ and Updated Solicitation

- Official NSF BPC FAQ

www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf20110

- CISE Core Programs solicitation

www.nsf.gov/funding/pgm_summ.jsp?pims_id=505667

Getting Started

Burçin Tamer
Computing Research Association



What will you find at BPCnet.org?

- Rubrics, templates
- FAQ
- Events: past and future
- Curated BPC advice, activity library, data
- Access to feedback options

BPCnet.org



[PROJECT PLAN](#) [DEPARTMENTAL PLAN](#) [EVENTS](#) [FAQ](#) [SUBMIT YOUR PLAN](#) [RESOURCES](#) [STATISTICS](#)

Write a BPC Plan

All Medium and Large CISE Core Programs, Secure and Trustworthy Cyberspace (SaTC), and Cyber-Physical Systems (CPS) project proposals require an approved BPC plan by the time of award.

A *Project BPC Plan* is submitted to NSF as a supplementary document that details the proposed BPC activities of the PIs. A Project BPC Plan may reference and link to one or more Departmental BPC Plans. A *Departmental BPC Plan* serves to coordinate BPC activities within a department and provide context for the activities proposed by PIs in their Project BPC Plan.

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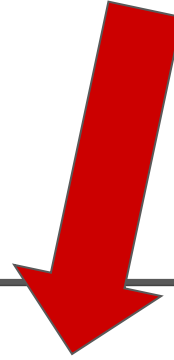
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Events to Help You Develop Your Plans

Departmental BPC Plan Events

The Departmental BPC Plan serves to coordinate BPC activities within a department and provide context for the activities proposed by PIs in their Project BPC Plan.

Upcoming Departmental BPC Plan Events:

We are offering two free virtual Departmental BPC Plan Events in Summer 2020. Visit [this page for more details](#).

- Workshop 2: August 6-7, 2020. [Click here to apply](#) for the August workshop.

Past Departmental BPC Plan Events:

- BPC Plan Writing Workshop: Workshop 1 (Materials will be posted soon)

Project BPC Plan Events

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Upcoming Project BPC Plan Events:

Writing a BPC Plan for Your NSF Proposal

- **Description:** Hear from NSF Program officer Dr. Jeff Forbes and BPCnet.org contributor Dr. Colleen Lewis about strategies for developing an impactful BPC Plan for submission with CISE NSF proposals.
- **Date:** Tuesday, August 18, 2020
- **Time:** 1pm Pacific/2pm Mountain/3pm Central/4pm Eastern
- **Duration:** 1 hour
- **Register:** [LINK](#)

BPCnet.org



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Resources

The following resources may be helpful to you writing Individual and Departmental BPC Plans.

Resources for Selecting BPC Activities

Departments should aim to deepen, improve or expand their BPC activities and data collection each year. The following categories may serve as a resource for guiding that work.

Student and Faculty Retention: Retention is an important focus for BPC work. The following five categories can drive effective retention efforts.

- **Curriculum and Pedagogy:** Monitor and improve curriculum and pedagogy. (Resources are available for [Curriculum and Pedagogy](#).)
- **Building Community:** Provide funding for affinity groups to build community among students or faculty who are underrepresented in computing. (Resources are available for [Building Community](#).)
- **Data:** Track data related to student or faculty retention. (Resources are available for [Data and Evaluation](#).)
- **Departmental Policy:** Monitor and improve institution policies that may have a negative impact on students or faculty who are underrepresented in computing. (Resources are available for [Improving Departmental Policies](#).)
- **BPC Education:** Create opportunities for students, staff, and faculty to learn about BPC. (Resources are available for [BPC Education](#).)

Outreach and Recruiting: Departments can contribute to the national goals for BPC through outreach to K-12 students or community members. Additionally, departments can recruit students and faculty to their department who are underrepresented in computing:

- **Outreach to K-12:** Engage in activities that serve K-12 students who are underrepresented in computing regardless of whether or not the students will matriculate at your institution. (Resources are available for [K-12 Outreach](#).)
- **Outreach to K-12 Teachers and Schools:** Engage in activities that serve K-12 teachers that are teaching students who are underrepresented in computing regardless of whether or not the students will matriculate at your

Selecting BPC Activities

Data and Evaluation

Publicly Available Data

Institutional Data

Evaluation Data

Student and Faculty Retention

Curriculum and Pedagogy

Building Community

Departmental Policy

BPC Education

Outreach and Recruiting

K-12 Students

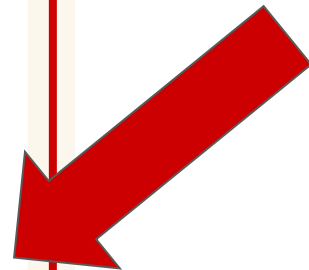
K-12 Teachers and Schools

K-12 Policy Makers

Recruit Students

Expand Research Opportunities

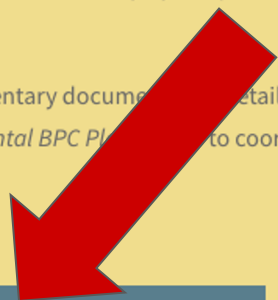
Example BPC Goals



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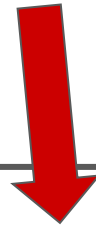
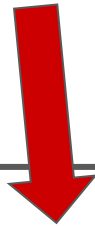
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BPCnet.org



PROJECT PLAN

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STATISTICS



Three BPC Documents

Project (NSF) BPC Plans

- Submitted to the NSF
- 1-3 pages
- Describe the roles of each PI
- **Goal:** Get PIs to do impactful BPC activities

Internal Dept. Document

- Not submitted
- Any number of pages
- Describe how faculty can get involved
- **Goal:** Make it easier for faculty to get involved and write BCP Plans for their NSF proposal

Department BPC Plan

- Submitted to BPCnet
- 2 pages
- Describe the BPC activities in the dept.
- **Goal:** Help organize departmental activities

Templates

Rubric

Example Plans

Departmental BPC Plans

A Departmental BPC Plan serves to coordinate BPC activities within a department (or college, school, or other similar unit) and provides context for the activities proposed by PIs in their Project BPC Plan. A few approved Departmental BPC Plans are below.

Your Departmental BPC Plan is a dynamic plan that can be updated over time as your Departmental BPC activities change.

To begin, download the Template for Departmental BPC Plans:

[GOOGLE DOC TEMPLATE](#)

[LATEX TEMPLATE](#)

Checklist for Departmental BPC Plans

Each Departmental BPC Plan should include the components in the following checklist, all of which are required in order to be submitted to BPCnet.org for approval ([More info](#)).

1. Header

- Includes the institution's name and the name of the department.
- Includes a start and end date for the Departmental BPC Plan.
- Includes a date by which preparation of the next version of the Departmental BPC Plan will begin.
- Includes the name, role, and contact information for the individuals responsible for overseeing the Departmental BPC Plan.

2. Context

- Relevant, currently available data is included.

Resources are available for [Data and Evaluation](#).

3. Goals

- At least one specific, measurable, attainable, relevant, and time-bound (SMART) goal is included.
- Each goal is motivated by currently available data disaggregated by the demographic group addressed in that goal.
- Each goal is focused on BPC as defined by NSF (race/ethnicity, gender, disability).

Resources are available for [Writing BPC Goals](#).

4. Activities and Evaluation

- Each BPC goal has some activities and evaluation that are aligned with it. Additional BPC activities and evaluation that are ongoing in the department but not aligned with the provided departmental BPC goal(s) can be included with less detail.
- Most activities are overseen by a specific person or people.
- It is always clear whether an activity and evaluation is new or ongoing.

Resources are available for [Selecting BPC Activities](#) and [Data and Evaluation](#).

Example Departmental Plans

The following Departmental BPC Plans have been approved by BPCnet.org:

- Colorado School of Mines: [[2 page Departmental BPC Plan](#)] and [[Internal Departmental BPC Plan document](#)]
- University of Notre Dame: [[2 page Departmental BPC Plan](#)]
- University of Utah: [[2 page Departmental BPC Plan](#)]

BPC Plan Templates

Click this [LINK](#) to make a copy of the doc

Blue text shows the instructions that should be replaced or deleted when writing your plan.

★ Getting Started?

Follow the "Getting Started" recommendations in each section to create an effective BPC Plan.

BPC Plan
Department Name
University Name

Effective dates of plan: Identify the effective dates of this Departmental BPC plan. Three to four years is recommended. The activities in a plan may be ongoing and introducing and establishing a structure for the ongoing continuance of an activity beyond the term of the plan is appropriate.

Revision of plan will begin: Identify the date by which preparation of the next version of the Departmental BPC Plan will begin.

Contact: Identify the person or people responsible for overseeing the Departmental BPC Plan.

- ★ **Getting started?** Create a 3-year Departmental BPC Plan so that PIs who are writing grants have a projection of what activities they can participate in. The activities for years 2 and 3 will likely change, but the first year should be detailed and realistic. After 6 months you will likely have more data to guide your activities in years 2 and 3. After 6 months, produce the second version of the Departmental BPC Plan, which will cover the following 3 to 4 years.

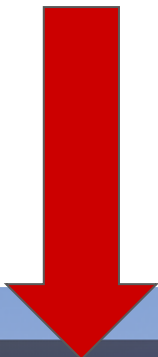
Relevant rubric items:

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Context

Identify the relevant data that your department has collected or compiled. This data should motivate your current and proposed activities. (Resources are available for [Data and Evaluation](#).)

- ★ **Getting started?** Follow the instructions for "Compiling Publicly Available Data" on the resources page for [Data and Evaluation](#). Consider signing up for the free Data Buddies Survey (<https://cra.org/cerp/data-buddies/>), which will survey your students and provide an annual report.



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The BPCnet Resource Portal seeks to amplify efforts in broadening participation in computing. This portal is for NSF PIs and Department Chairs as a resource to simplify and increase significance of the Broader Impacts components of every CISE proposal and Departmental Plan. The BPCnet Resource Portal is a clearinghouse for the community to learn about and engage with ongoing projects to diversify computing.

NCWIT: Counselors for Computing (C4C)

NCWIT Counselors for Computing (C4C) provides professional school counselors with information and resources they can use to support ALL students as they explore computer science education and careers. C4C conveys this information at workshops across the country, including high schools, community colleges, colleges, and industry partners. CISE PIs are invited to host a C4C event on your campus.



Level(s) Targeted by Program:

High School, Middle School

URG(s) Targeted by Program:

American Indian or Alaska Native, Black or African American, Hispanic, LGBTQ, Native Hawaiian or Pacific Islander, Persons with Disabilities, Women

Activity:

Partnering

CSTA: CS National Honor Society

The Computer Science National Honor Society is a project for teachers that encourages enthusiasm for computer science and promotes and recognizes academic excellence and service among high school computer science students.



Level(s) Targeted by Program:

High School

URG(s) Targeted by Program:

American Indian or Alaska Native, Black

Activity:

Partnering

Search

42
Result(s) Shown

Filters

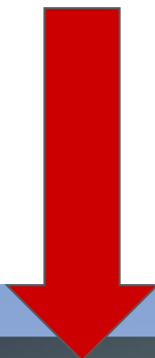
Check or uncheck these filters to show resources filtered by your choices. If no choices are made, all resources will be displayed (default state).

Activity

- Departmental (26)
- Partnering (37)

Level

- Early Career (12)
- Elementary School (7)
- Graduate (24)
- High School (18)
- Mid-Career (11)



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Completed your Departmental BPC Plan??



- Get it verified
- Post it on BPCnet.org



Submit Your Departmental BPC Plan

A Departmental BPC Plan serves to coordinate BPC activities within a department (or college, school or other similar unit) and provides context for the activities proposed by PIs in their Project BPC Plan.

Please use the below form to submit your plan for verification:

Departmental BPC Plan Submission Form

First Name *

Last Name *

Email *

Institution *

Department *

During your process of creating this Departmental BPC Plan, did you receive help from a BPC Plan Consultant through BPCnet.org? *

- No
- Yes (please specify who you worked with)

Attach your Departmental BPC Plan here: *

No file chosen

Getting ready to get started

- ❑ Create a list of current BPC activities happening in your department
- ❑ Identify institution resources for BPC or inclusive teaching
- ❑ Gather relevant demographic data

Questions?

Context and Goals

Mary Hall
University of Utah



BPC = Increasing Participation of Groups Currently Underrepresented in Computing

Broadening Participation in Computing (BPC)



From <https://www.nsf.gov/cise/bpc/> :
“...including women, African Americans, Hispanics, American Indians, Alaska Natives, Native Hawaiians, Native Pacific Islanders, and persons with disabilities ...”

- From an institutional perspective:
 - Relative to their % in the university population
 - Possibly, relative to their % in the community population

Identifying and Articulating your Context

From Departmental Plan template

Context

Identify the relevant data that your department has collected or compiled. This data should motivate your current and proposed activities. (Resources are available for [Data and Evaluation](#).)

1. Start with demographic data (institutional, publicly available)
2. Dig deeper into data to try to identify challenges and opportunities
3. Use context data to establish goals

Demographic Data from BPCnet.org/statistics/

Computing Degrees Awarded

K-12 Enrollment

IPEDS: Institution Computing Degrees Awarded

Copy Table

Download Table

Select State/Territory:

Utah

Select Institution Name:

University of Utah

Select Degree Type:

Bachelor's

Show data for:



Select view for student sex:

Sex	Race/ Ethnicity	Inst. Awards (N)	Inst. Awards (%)	State Awards (N)	State Awards (%)	National Awards (N)	National Award (%)
Female	American Indian or Alaska Native	0	0	8	0.09	145	0.0
Female	Asian	14	2.03	40	0.45	6825	3.0
Female	Black	1	0.14	53	0.6	4325	1.9
Female	Hispanic	5	0.72	52	0.59	3770	1.7
	Native						

University of Utah, School of Computing Demographics

Some Success

- Tripled % women undergrads in last decade (4-13%), degree recipients (5-15%)

Challenge

- Demographics of undergraduate program do not match university or state

	Utah	UofU	SoC
Women	50%	47%	13%
Latinx	14%	13%	8%

Opportunity

- Recruit students already at the university
- Recruit from K-12, enclosing Salt Lake City School District
 - 56% of students “belong to a minority group”, mostly Latinx
 - More than half of elementary and middle schools are Title I schools

Deeper Analysis: More Data

Obtain institutional or departmental data on demographics of individual classes, and course performance

1. Recruiting issue?
 - What are the percentage of women and Latinx students in introductory courses?
(Women: 25% or less; Latinx: 11% or less)
1. Retention issue?
 - Is the percentage of women steady through the freshman and sophomore year?
(No: CS0 = 24%, CS1 = 17%, CS2 = 13%, SoftEng = 12%)
 - Is the D/F/W rate in CS1 higher for women? (Yes)

Deeper Analysis: Work with Experts



NCWIT Extension Services: Learning Circles

- Three academic departments plus NCWIT Consultant and Staff
- Engagement
 - Application demonstrating support from departmental leadership
 - Monthly meetings for a year
 - Survey students in early classes to identify recruiting successes / challenges / opportunities
 - Develop plan, similar to goals for BPC Plan

<https://www.ncwit.org/extension-services-learning-circles>

Context Used to Establish Goals

From Departmental Plan template

Goals

Identify the goals you will pursue during the effective dates of the Departmental BPC Plan. These goals should be motivated by the currently available data and be accomplished by the included activities. Resources are available for [Writing BPC Goals](#).

University of Utah Goals

Context analysis identifies issues in both recruiting and retention

Goals:

1. Expand undergraduate mentoring and research to increase recruiting and retention of groups underrepresented in computing by more than 50% in five years, with an emphasis on women and Latinx students.
2. Promote community-building activities for diverse students, critically important for retention of women and Latinx students given the context.
3. Create computing-specific K-12 outreach programs for local Title I schools with diverse populations, with the goal of stimulating early interest in computing.

Resources for Writing BPC Goals

BPC goals articulate the intended outcome of activities and provide a specific date by which that outcome will be reached. BPC goals identify the underrepresented group that is a focus of the activity. Resources are available for [Selecting BPC Activities](#), which subdivides activities into the following hierarchy. An example BPC Goal is provided for each.

Example Goals – Student

- **Curriculum and**

- Faculty (class sessions receiving)
- Beginning outcome positive
- By YEAR session

- **Community:** (Faculty)

- By YEAR, at least 80% of all student subgroups (e.g. women and students who are underrepresented in computing) will report being satisfied with the computing program on the annual Data Buddies survey.
- By fall YEAR, leaders in our Black student group and ACM-W chapter will report having sufficient departmental funding for their activities. At least 80% of these chapter leaders will report that

37
Example
Goals

Selecting BPC Activities

Data and Evaluation

Publicly Available Data

Institutional Data

Evaluation Data

Student and Faculty Retention

Curriculum and Pedagogy

Building Community

Departmental Policy

BPC Education

Outreach and Recruiting

K-12 Students

K-12 Teachers and Schools

K-12 Policy Makers

Recruit Students

Expand Research Opportunities

Example BPC Goals

Impactful BPC Activities

Colleen Lewis

ColleenL@illinois.edu

CSTeachingTips.org

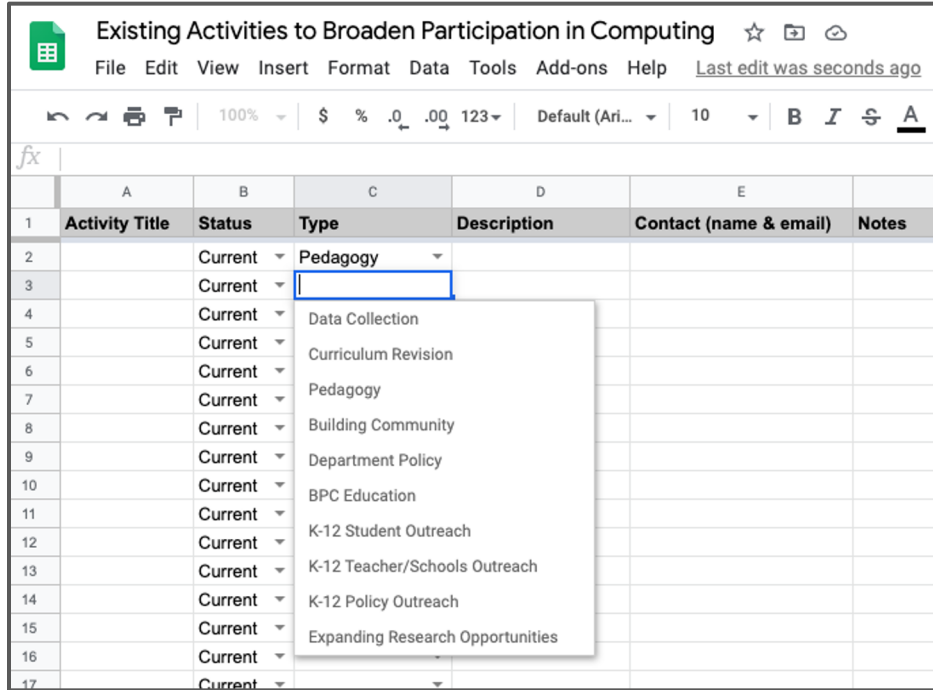


CRA

Computing Research
Association

BPCnet
RESOURCE PORTAL

Do you know what BPC activities already exist?



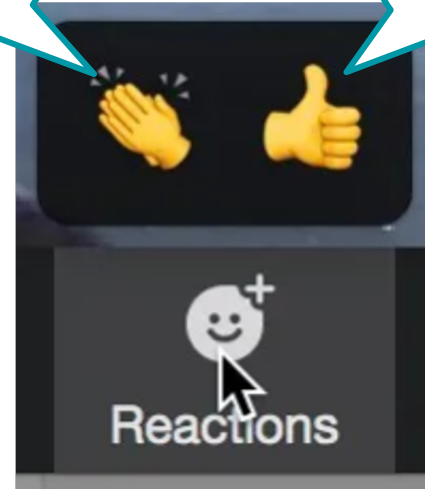
Existing Activities to Broaden Participation in Computing

File Edit View Insert Format Data Tools Add-ons Help Last edit was seconds ago

	A	B	C	D	E	
1	Activity Title	Status	Type	Description	Contact (name & email)	Notes
2		Current	Pedagogy			
3		Current				
4		Current	Data Collection			
5		Current	Curriculum Revision			
6		Current	Pedagogy			
7		Current	Building Community			
8		Current	Department Policy			
9		Current	BPC Education			
10		Current	K-12 Student Outreach			
11		Current	K-12 Teacher/Schools Outreach			
12		Current	K-12 Policy Outreach			
13		Current	Expanding Research Opportunities			
14		Current				
15		Current				
16		Current				
17		Current				

Not
Yet

Yes



Make a copy of this template: tinyurl.com/ActivityListBPC



Google Sheets

Copy document

Would you like to make a copy of ?

Make a copy



Make a copy of this template: tinyurl.com/ActivityListBPC

List of BPC Activities tinyurl.com/ncwitActivities

tinyurl.com/ncwitActivities

Extension Services for Undergraduate Programs Activity Reference Sheet

Increase Enrollment

- Participate in events held by admissions or other campus offices (e.g., give presentations at orientation)
- Develop and deliver messaging that will inform potential majors about career opportunities and the nature of computing and engineering work
- Have students or faculty act as ambassadors for the major at admissions events (e.g., orientation)
- "Market" your major to undeclared majors
- Create a strategic recruiting plan that targets qualified and readily available potential students
- Offer a minor
- "Market" your minor to students with other majors
- Provide relevant and accurate information (e.g., "Talking Points") to the admissions, advising, and other offices that might speak on your behalf
- Have faculty inform and personally recruit capable students in non-major introductory courses
- Develop an appealing web site and brochures for diverse prospective students
- Print and distribute posters about your program
- Provide information to K12 teachers, guidance counselors, etc.
- Have students conduct "roadshows" in high schools (and have local current undergrads recruit from

Faculty may assume that BPC always involves

- Outreach to K-12 students
- Sending students to a diversity-focused conference

Do these take advantage of
faculty members' skills and spheres of influence?

Where can faculty most effectively create change?

- Improving their pedagogy
 - Revising their curriculum
 - Improving departmental policies
 - Learning about BPC
- Expanding research opportunities
 - Monitoring BPC data

BPCnet.org Resources for Selecting Activities

[ABOUT](#) [CONTACT US](#)



[PROJECT PLAN](#)

[DEPARTMENTAL PLAN](#)

[EVENTS](#)

[FAQ](#)

[SUBMIT YOUR PLAN](#)

[RESOURCES](#)

[STATISTICS](#)

Resources for Selecting BPC Activities

Departments should aim to deepen, improve or expand their BPC activities and data collection each year. The following categories may serve as a resource for guiding that work.

Student and Faculty Retention: Retention is an important focus for BPC work. The following five categories can drive effective retention efforts.

- **Curriculum and Pedagogy:** Monitor and improve curriculum and pedagogy. (Resources are available for [Curriculum and Pedagogy](#).)
- **Building Community:** Provide funding for affinity groups to build community among students or faculty who are underrepresented in computing. (Resources are available for [Building](#)

Selecting BPC Activities

Data and Evaluation

Publicly Available Data

Institutional Data

Evaluation Data

Student and Faculty

Retention

Curriculum and Pedagogy

Building Community

Categories of BPC Activities on BPCnet.org

- **Student Retention**
 - Curriculum and Pedagogy
 - Building Community
 - Data
 - Departmental Policy
 - BPC Education
- **Outreach and recruiting**
 - Outreach to K-12 Student
 - Outreach to K-12 Teacher and Schools
 - K-12 Policy Outreach
 - Recruit Students
 - Expanding Research Opportunities

Resources for Selecting BPC Activities

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- **Curriculum and Pedagogy:** Monitor and improve curriculum and pedagogy. (Resources are available for [Curriculum and Pedagogy](#).)
- **Building Community:** Provide funding for affinity groups to build community among students or faculty who are underrepresented in computing. (Resources are available for [Building Community](#).)
- **Data:** Track data related to student or faculty retention. (Resources are available for [Data and Evaluation](#).)
- **Departmental Policy:** Monitor and improve institution policies that may have a negative impact on students or faculty who are underrepresented in computing. (Resources are available for [Improving Departmental Policies](#).)
- **BPC Education:** Create opportunities for students, staff, and faculty to learn about BPC. (Resources are available for [BPC Education](#).)

Outreach and Recruiting: Departments can contribute to the national goals for BPC through outreach to K-12 students or community members. Additionally, departments can recruit students and faculty to their department who are underrepresented in computing:

- **Outreach to K-12:** Engage in activities that serve K-12 students who are underrepresented in computing regardless of whether or not the students will matriculate at your institution. (Resources are available for [K-12 Outreach](#).)
- **Outreach to K-12 Teachers and Schools:** Engage in activities that serve K-12 teachers that are teaching students who are underrepresented in computing regardless of whether or not the students will matriculate at your institution. Work with high-school counselors who play an important role in helping students select classes and opt into high-school CS classes when available (Resources are available for [Outreach to K-12 Teachers and Schools](#).)
- **Outreach to K-12 Policy Makers:** Engage with state-level stakeholders and policy makers to update teacher certification policies or other policies related to BPC at the K-12 level (Resources are available for [Outreach to K-12 Policy Makers](#).)
- **Recruit underrepresented students:** Recruit potential graduate students, high school students or community college students to attend your institution or recruit undeclared majors from your institution to declare a computing major or take computing courses. (Resources are available for [Recruiting Students](#).)
- **Expand opportunities for research:** Recruit and/or mentor students who are underrepresented in computing. (Resources are available for [Expanding Research Opportunities](#).)

Selecting BPC Activities

Data and Evaluation

Publicly Available Data

Institutional Data

Evaluation Data

Student and Faculty Retention

Curriculum and Pedagogy

Building Community

Departmental Policy

BPC Education

Outreach and Recruiting

K-12 Students

K-12 Teachers and Schools

K-12 Policy Makers

Recruit Students

Expand Research Opportunities

Example BPC Goals

Resources for Expanding Research Opportunities

Research Experiences for Undergraduate (REUs) students who are underrepresented in computing are a long-term strategy for BPC among graduate students and faculty. Additionally, REU experiences can be a recruiting tool for graduate programs and help students gain important skills and mentorship that can be helpful to them in pursuing a computing degree. Research has shown that REU experiences can increase students' confidence and their interest in pursuing a PhD ([Russell et al., 2007](#)).

- **Host an REU student who is underrepresented in computing:** The Computing Research Association (CRA.org) has an REU matching program focused on BPC for the summer ([Distributed Research Experiences for Undergraduates; DREU](#)).
- **Strategies for effective REU experiences:** The Computing Research Association (CRA) has multiple resources for successful [REU mentoring](#) and [creating an effective REU program](#).
- **REU-in-a-Box:** A resource from the National Center for Women and Information Technology (NCWIT.org) guides faculty mentors through the stages of hosting an REU and [explains the research](#) regarding how REUs can lead to more graduate applications and stronger candidates.
- **Invite undergraduates to a research workshop:** Consider creating a program where students who are underrepresented in computing, come to campus for a few days to get a taste of research and meet faculty. Examples are available from Carnegie Mellon (<https://www.cmu.edu/cs/ourcs/>), Indiana University Bloomington (<https://doi.org/10.1145/3287324.3287493>), and University of Washington, Seattle (<https://www.washington.edu/accesscomputing/ourcsuwaccesscomputing>). Funding is available from Google (<https://research.google/outreach/explore-csr/>).

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Expand Research Opportunities

Example BPC Goals

Resource for Impactful BPC Activities

- Recommended activities [BPCnet.org](https://www.bpcnet.org)
- Current activities template tinyurl.com/ActivityListBPC
- List of some BPC activities tinyurl.com/ncwitActivities

For every activity, ask:

Does this take advantage of our department members' skills and spheres of influence?

What is the expected impact?

Impactful BPC Activities

Colleen Lewis

ColleenL@illinois.edu

CSTeachingTips.org



CRA

Computing Research
Association

BPCnet
RESOURCE PORTAL

Evaluation

Tracy Camp

Department Head of Computer Science

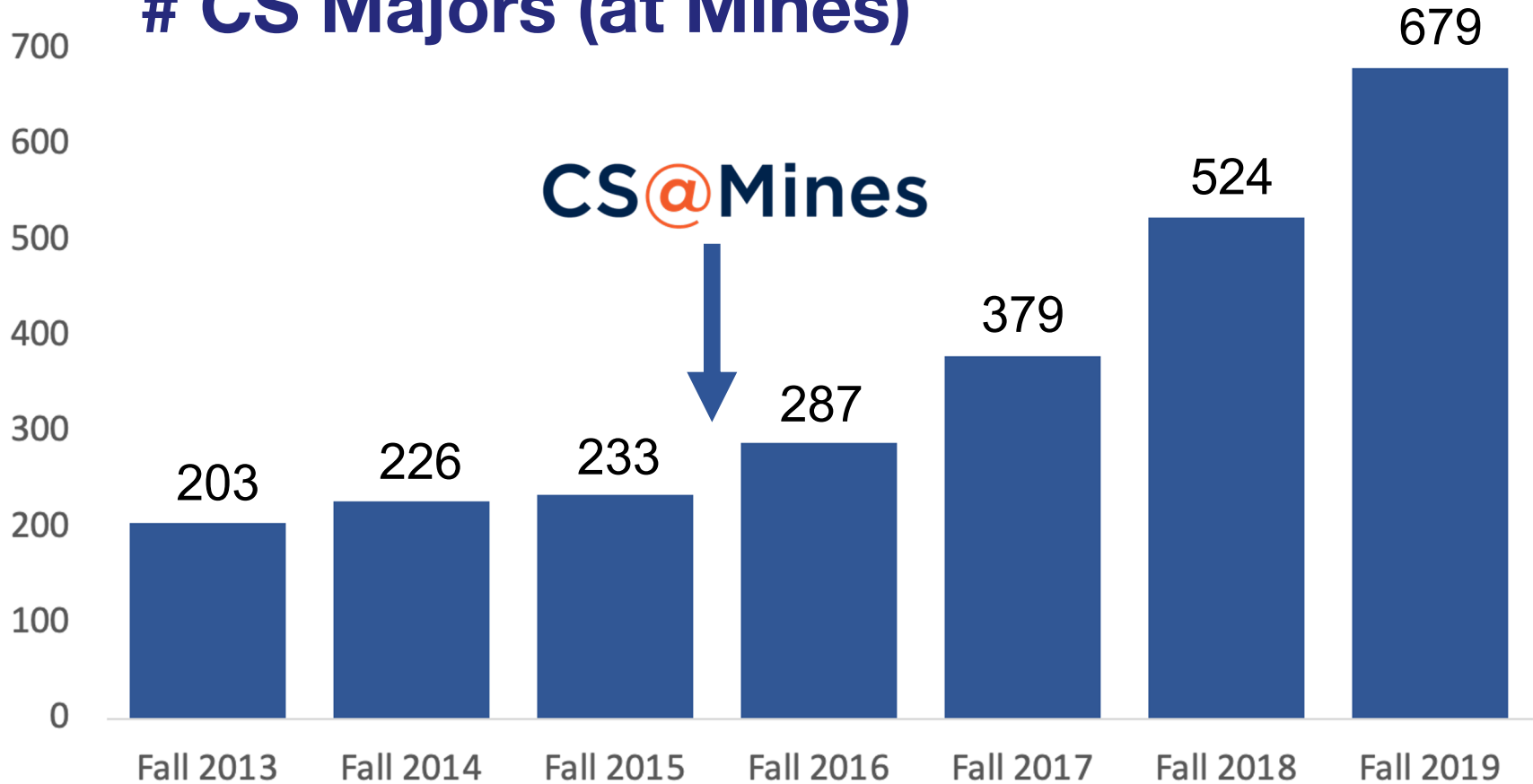
Colorado School of Mines

tcamp@mines.edu



CS @ Mines

CS Majors (at Mines)





	Fall 2008	Fall 2019	Change
UG Majors	157	679	~4.3x
Women (#)	17	148	~9x
URG (#)	12	146	~12x

	Fall 2008	Fall 2019	Change
UG Majors	157	679	~4.3x
Women (%)	10.8%	21.8%	~2x
URG (%)	7.6%	21.5%	~3x

	Fall 2008	Fall 2019	Change
UG Majors	157	679	~4.3x
Women (%)	10.8%	21.8%	~2x
URG (%)	7.6%	21.5%	~3x

Women at Mines: ~30%

URG at Mines: ~17%

What did CS@Mines do??

Several Impactful BPC Activities

Recruitment activities

Retention activities

Welcoming culture (space/activities)

Transfer efforts

Visible signs that diversity is important

etc.

List of BPC Activities tinyurl.com/ncwitActivities

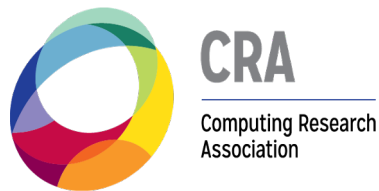
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Evaluation: KEY for Success



Overall Process

- 1. Determine Context and Set Goals (Mary)**
- 2. Implement Activities Strategically (Colleen)**
- 3. Evaluate (Tracy)**
- 4. Feedback loop**

Overall Process

1. **Determine Context and Set Goals (Mary)**
2. **Implement Activities Strategically (Colleen)**
3. **Evaluate (Tracy)**
4. **Feedback loop**

BPCnet.org Resources for Data and Evaluation

ABOUT CONTACT US



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Resources for Data and Evaluation

Data is essential for motivating your proposed activities and evaluating the impact of your activities at achieving desired outcomes. Data can be collected directly from BPC activity participants, from the institution, region, or field. This page has resources for compiling publicly available data, recommendations for compiling participation data from the department, and collecting data to guide improvements or expansion of BPC activities.

Selecting BPC Activities

Data and Evaluation

Publicly Available Data

Institutional Data

Evaluation Data



BPCnet.org Resources for Data and Evaluation

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PROJECT PLAN DEPARTMENTAL PLAN EVENTS FAQ SUBMIT YOUR PLAN **RESOURCES** STATISTICS

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Evaluation Data



Public Data:

U.S. postsecondary data (IPEDS)

U.S. K-12 Students (CCD)

NCWIT Scorecard

CRA Taulbee

ACM NDC

BPCnet.org Resources for Data and Evaluation

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Evaluation Data



Monitor your data:



Institutional Data:

**Applications, Acceptances, Enrollments
Retention/Attrition**

Institutional Data:

**Applications, Acceptances, Enrollments
Retention/Attrition**

e.g., 21.2% accept vs. 16.7% enrolled (females)

⇒ 24% enrolled (females)

Institutional Data:

**Applications, Acceptances, Enrollments
Retention/Attrition**

DFW rates (esp for early courses)

Institutional Data:

**Applications, Acceptances, Enrollments
Retention/Attrition**

DFW rates (esp for early courses)

CS@Mines Data Chair

BPCnet.org Resources for Data and Evaluation

ABOUT CONTACT US



PROJECT PLAN DEPARTMENTAL PLAN EVENTS FAQ SUBMIT YOUR PLAN **RESOURCES** STATISTICS

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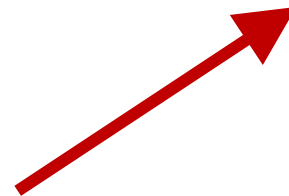
Selecting BPC Activities

Data and Evaluation

Publicly Available Data

Institutional Data

Evaluation Data



Understand your STUDENTS



Understand your STUDENTS



CERP

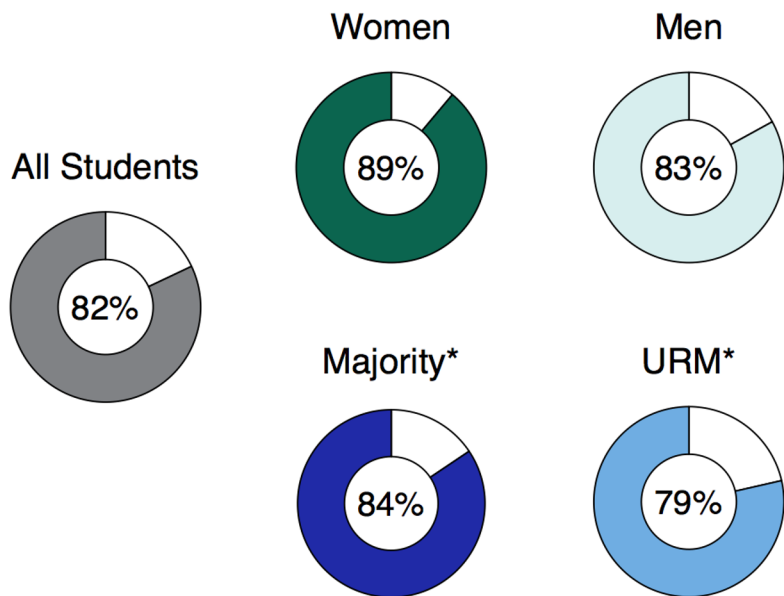
Computing Research
Association
Evaluation

CRA Data Buddies Survey

BPCnet
RESOURCE PORTAL

Satisfaction with the computing program

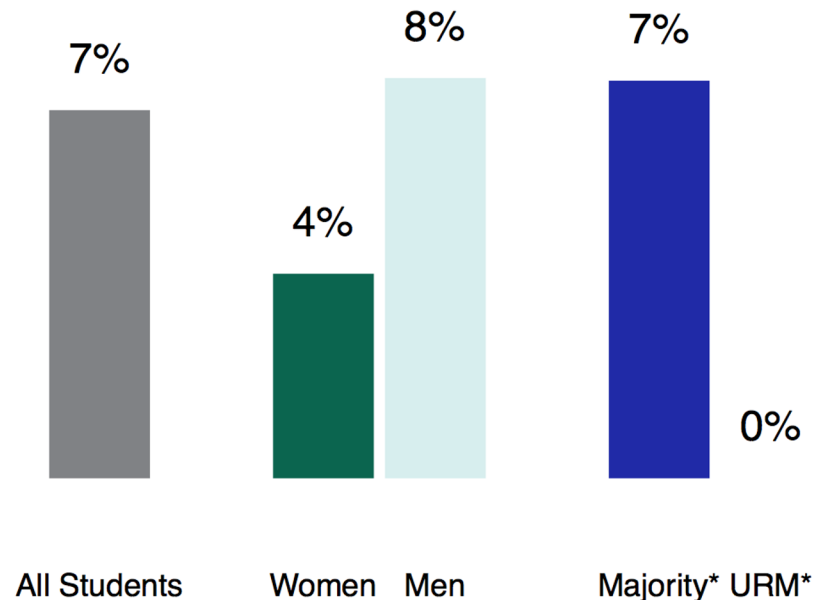
At your institution, the following are satisfied with the computing program**:



Thought about leaving computing major

At your institution, the following thought about leaving their computing major**:

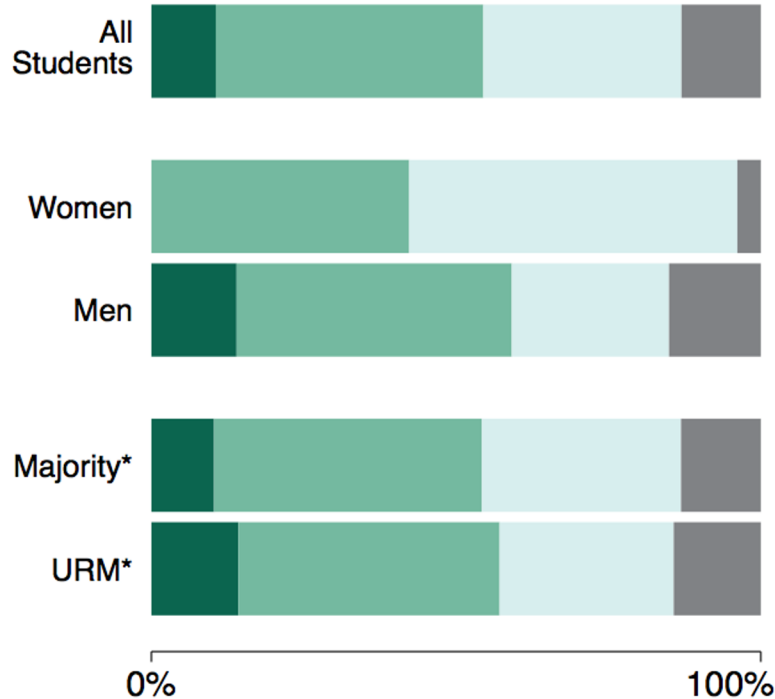
CS@Mines



Highest degree plans of your students

Your students' highest intended degree**:

■ Ph.D. ■ Master's ■ Bachelor's ■ Uncertain



Plans

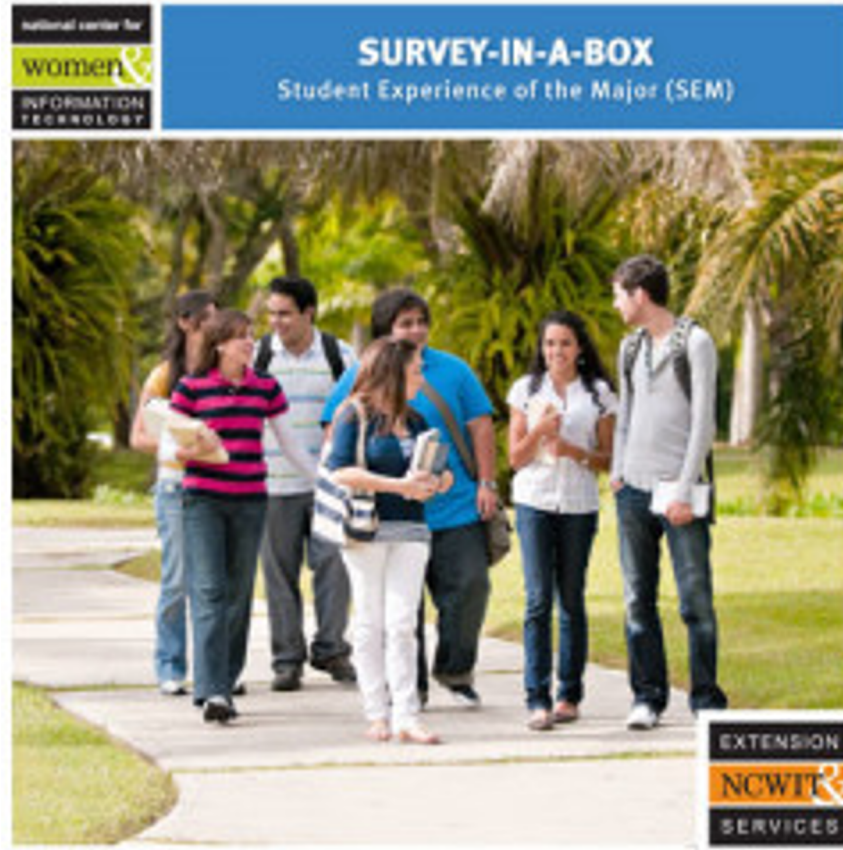
CS@Mines

What is the highest degree you plan to attain?	Women	Men
Bachelor's degree (significant)	52%	26%

Shared with Dean (significant)

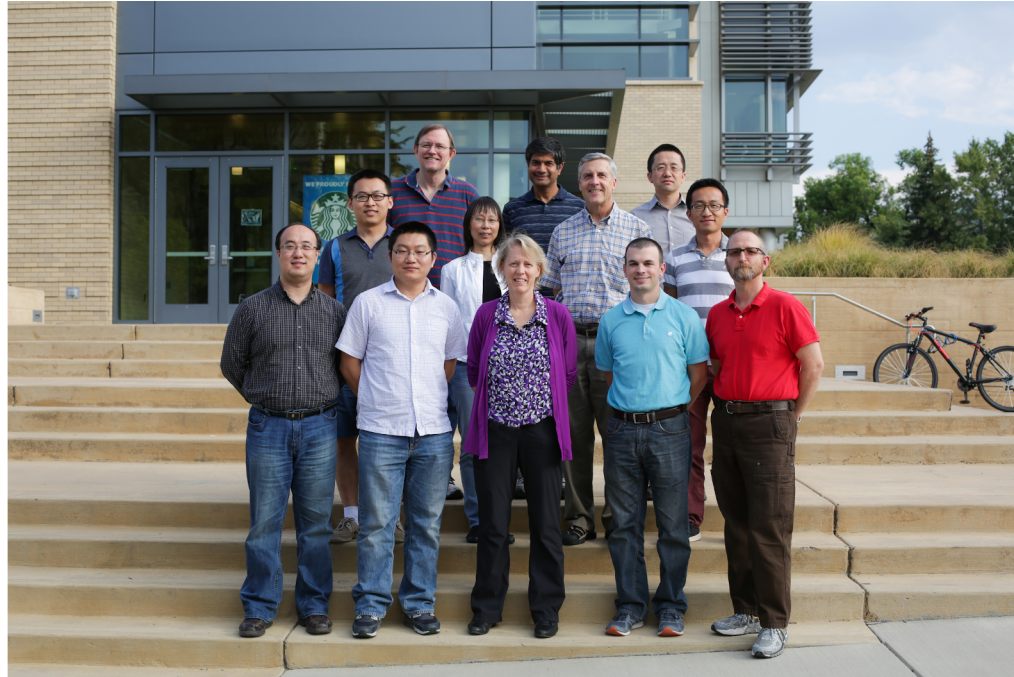
Question	Mines	Comparison group
I am confident that I can complete my undergraduate degree in computing	4.89 (0.32)	4.51 (0.85)
Overall, I am satisfied with the computing program at my institution	4.33 (0.85)	3.90 (1.07)
The department is NOT very supportive of its students	1.81 (0.93)	2.43 (1.10)
My department cares about its students	4.37 (0.71)	3.73 (1.00)
Who do you consider to be a mentor? (prof within my department)	61%	40%

Understand your STUDENTS



NCWIT Student Experience of the Major (SEM)

Understand your DEPARTMENT



Understand your DEPARTMENT

NCWIT GPS Tool (draft)

“... academic departments can use to identify where they are in developing a culture of inclusion.”

Understand your DEPARTMENT

Self-assessment Worksheet from Berkeley

“... help departments consider their current and potential connections to the campus’s equity, inclusion, and diversity goals.”

<https://diversity.berkeley.edu/sites/default/files/academic-strategic-toolkit-final.pdf>

BPC Activity Evaluation



Directorate for Education
and Human Resources



Division of Research and
Learning in Formal and
Informal Settings
National Science Foundation

The 2010 User-Friendly Handbook

for Project Evaluation

BPCnet
RESOURCE PORTAL

BPC Activity Evaluation



NCWIT 101 Course:

Introduction to Diversifying Undergraduate Computing Programs

Module 5:

Evaluating Your Diversity and Outreach Efforts



Example BPC Activity Evaluation

Implicit bias training

Metrics:

% of faculty/staff who attend training

% of students who attend training

Data and Evaluation

DO:

Collect data to iteratively improve activities

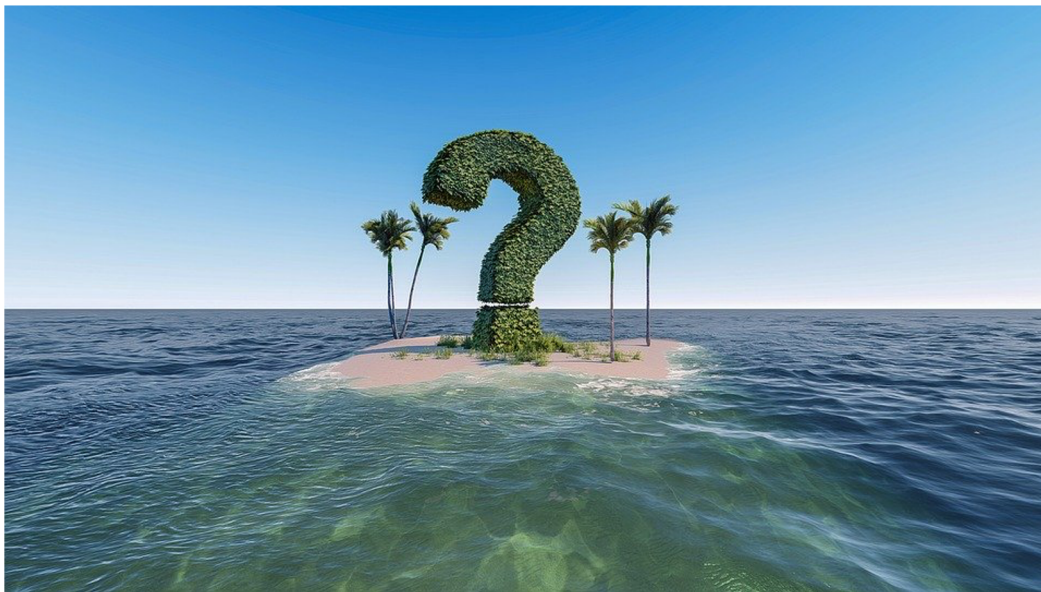
DON'T

Assume each activity will work as intended

Overall Process

- 1. Determine Context and Set Goals (Mary)**
- 2. Implement Activities Strategically (Colleen)**
- 3. Evaluate (Tracy)**
- 4. Feedback loop**

What questions do you have?



Overcoming Institutional Barriers

Ron Metoyer

rmetoyer@nd.edu

University of Notre Dame



CRA

Computing Research
Association



What barriers, if any, do you anticipate?

How many of you have worked on BPC activities for many years?

Barrier #1 - Baggage from past experience

- Start from a positive place
- Don't assume barriers based on prior experience
- This is an opportunity to **lead** an effort that has renewed importance
- Your faculty want to do better
- You'll be pleasantly surprised, especially in today's climate
- Bring your knowledge/experience with BPC to the table
- Focus on what can be changed - your specific levers



Raise your hand if you think it's going to be a challenge to get buy-in?

Barrier #2: Making sure everyone sees their role

- Strive to find consensus among your colleagues regarding goals and activities
- Figure out your departmental challenges as a *team*
- You want everyone (who wants to) to 1) buy into the goals and 2) see how they fit into the BPC plan activities
- Build upon activities already in place where possible and relevant
- Socialize revisions throughout the process



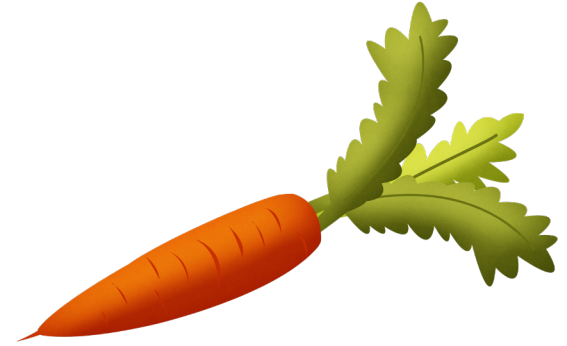
Barrier #3: Getting Data

- To establish context, you need data that may be hard to come by
- IPEDS data is available through the BPCNet Portal <https://bpcnet.org/resources-one-page/#data-evaluation>
- Become a Databuddy: <https://cra.org/cerp/data-buddies/>
- When you cannot get data from Institutional Research (e.g. due to small numbers), consider grass roots collection within your department
- Establish a Data Coordinator as part of your plan!



Barrier #4 People/Participation

- What if your chair is not on board?
- Find ways to incentivize genuine participation
 - Convince them BPC is important
 - Integrate into merit review



It was an all-hands effort by our department faculty, who reported diversity activities as part of their annual review. Our departmental diversity committee compiled a list of activities ranging from “light effort” (e.g., attending a luncheon with students at the College of Engineering women’s dorm) to “heavy commitment” (e.g., serving as advisor to a co-curricular group focusing on diversity such as our Association for Women in Computing [AWC] grad and undergrad women’s club). -- Barbara Ryder (Former Chair CS VTech)

- Build into Promotion and Tenure considerations



Other Barriers

- Legal -- Girls Who Code
- Admissions offices who don't want to cooperate
- Diversity program that doesn't "play nice"

What other institutional barriers do you anticipate?

Finalizing a BPC Plan & Next Steps

Burçin Tamer
Computing Research Association



To Do List

- Make a To-Do list**

- Write your plan**

- Feedback**

- Finish your plan**

- Get plan verified**

- Post plan on BPCnet**

BPC Plan Consultancy

- BPC experts will be answering questions, giving feedback, and reviewing plans
- Appointment based
- Departmental Plans & Project Plans
- Free!

Pick a date and time Change selection v

Duration: 30 minutes

Your time zone: United States; Eastern time (GMT-4:00) [DST] [\(Change\)](#)

August 2020							Available starting times for Fri, Aug 14, 2020	
Sun	Mon	Tue	Wed	Thu	Fri	Sat	AM	PM
						1	No AM times	1:15 PM
2	3	4	5	6	7	8		1:30 PM
9	10	11	12	13	14	15		1:45 PM
16	17	18	19	20	21	22		2:00 PM
23	24	25	26	27	28	29		2:15 PM
30	31							2:30 PM
< July							September >	

3:45 PM
4:00 PM
4:15 PM
4:30 PM

BPC Plan Consultancy

- Make your appointment
 - Link on the workshop website on BPCnet.org
- Prepare for your appointment!!
- Send your draft plan ahead of time
- Meet with your consultant
- Follow-up!

BPC Plan Consultancy

- Departmental Plans & Project Plans
- Free!

Pick a date and time

Duration: 30 minutes

Your time zone: United States; Eastern time (GMT-4:00) [DST] (Change)

[Change selection](#)

August 2020							<	>
Sun	Mon	Tue	Wed	Thu	Fri	Sat		
						1		
2	3	4	5	6	7	8		
9	10	11	12	13	14	15		
16	17	18	19	20	21	22		
23	24	25	26	27	28	29		
30	31							
< July							September >	

Available starting times for **Fri, Aug 14, 2020**

AM

No AM times

PM

1:15 PM

1:30 PM

1:45 PM

2:00 PM

2:15 PM

2:30 PM

3:45 PM

4:00 PM

4:15 PM

4:30 PM

About

Important Details

Schedule

Workshop Preparation

Contact

Before Workshop Days 1 & 2 (August 6-7, 2020)

We recommend that you prepare for Workshop Days 1 & 2 in the following ways:

1. Create a list of current BPC activities happening in your department

Past participants found it helpful to request department members to add current BPC activities (activity title/description, contact info) to a shared spreadsheet. [Example spreadsheet \(make a copy\)](#)

Email template: We ([participant names]) are attending a Broadening Participation in Computing (BPC) workshop to create a Departmental BPC Plan. We want to document our existing BPC activities. Please contribute to [document link]. These BPC activities might include curriculum and pedagogy, building community, data and evaluation, departmental policies, BPC learning, outreach, recruiting, or expanding research opportunities.

2. Identify institution resources for BPC or inclusive teaching

Many campuses have teaching and learning centers or diversity offices that can provide training or other resources. Consider emailing the diversity office to see if they could provide support for your Departmental BPC Planning process.

3. Gather relevant demographic data

Your Departmental BPC Plan will eventually document the demographics of your department, campus, and geographic region. You can begin by collecting data about your computing graduates and K-12 students in your state (<https://bpcnet.org/statistics>). More resources are available here: <https://bpcnet.org/resources-one-page/#data-evaluation>

Before Workshop Day 3 (August 13, 2020)

We recommend that you prepare for Workshop Day 3 in the following ways:

1. Register for Day 3

All participants of the July and August BPC Plan Workshops will receive a zoom registration link for Day 3 of the workshop (August 13, 2020). Please check your email to find the link.

2. Share your BPC Plan Draft

All participants of the July and August BPC Plan Workshops will receive a link to a Google Drive folder. Use this folder to submit your draft plan or outline of your plan. Please label the draft plan file as "[Institution] [Department] Draft Plan".

3. Check out the BPC Plan Consultancy Page

CRA and BPCnet are pleased to offer a new, free consultancy service that provides the opportunity for departments and Project PIs to schedule a time with a BPC expert to receive specific feedback on the current version of their Departmental BPC Plan or Project BPC Plan.

This opportunity is available to every member of the computing community who is working on a BPC Plan.

- While it is not required, we recommend that you send the current draft of your BPC Plan to your consultant when you make an appointment. You can do this through the appointment system.
- You can make 30 – 60 min long appointments and schedule follow-up appointments.

For more information about this service, email bpcinfo@cra.org.

To schedule a time with a BPC Plan Expert, visit the following link: <https://go.oncehub.com/BPCPlanConsulting>

CRA and BPCnet thank the National Science Foundation for their generous funding of this consultancy service.

Departmental BPC Plan Review/Verification

- Submit your Departmental BPC Plan!

Option 1: Work with a consultant, submit it to them when finished

Option 2: Already finished? Submit on BPCnet.org
(<https://bpcnet.org/submit-plan/>)



PROJECT PLAN DEPARTMENTAL PLAN EVENTS FAQ **SUBMIT YOUR PLAN** RESOURCES STATISTICS



Departmental BPC Plan Review/Verification

- BPC expert consultant will review
- Does your plan meet the recommendations on BPCnet.org?



→ Publish on BPCnet



→ Revise/ Consultancy

Checklist for Departmental BPC Plans

Each Departmental BPC Plan should include the components in the following checklist, all of which are required in order to be submitted to BPCnet.org for approval ([More info](#)).

1. Header

- Includes the institution's name and the name of the department.
- Includes a start and end date for the Departmental BPC Plan.
- Includes a date by which preparation of the next version of the Departmental BPC Plan will begin.
- Includes the name, role, and contact information for the individuals responsible for overseeing the Departmental BPC Plan.

2. Context

- Relevant, currently available data is included.

Resources are available for [Data and Evaluation](#).

3. Goals

- At least one specific, measurable, attainable, relevant, and time-bound (SMART) goal is included.
- Each goal is motivated by currently available data disaggregated by the demographic group addressed in that goal.
- Each goal is focused on BPC as defined by NSF (race/ethnicity, gender, disability).

Resources are available for [Writing BPC Goals](#).

4. Activities and Evaluation

- Each BPC goal has some activities and evaluation that are aligned with it. Additional BPC activities and evaluation that are ongoing in the department but not aligned with the provided departmental BPC goal(s) can be included with less detail.
- Most activities are overseen by a specific person or people.
- It is always clear whether an activity and evaluation is new or ongoing.

Resources are available for [Selecting BPC Activities](#) and [Data and Evaluation](#).

If you have any lingering questions,
email bpcinfo@cra.org

Thank you!

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Thank you!

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