THE UNIVERSITY OF NORTH CAROLINA SYSTEM

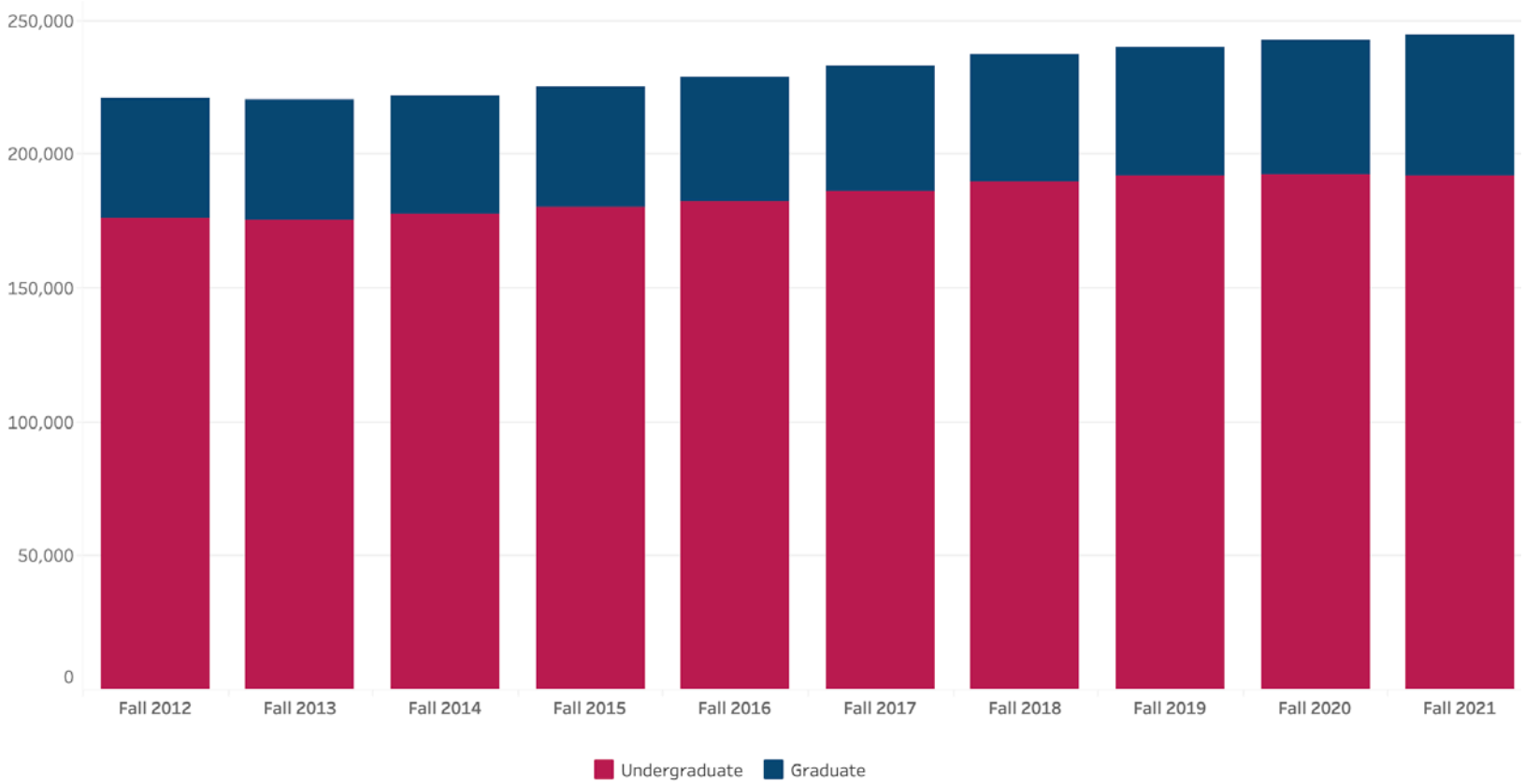
Dr. David English

Acting Senior Vice President for Academic Affairs

House Select Committee on Advancing Women in STEM

September 9, 2022

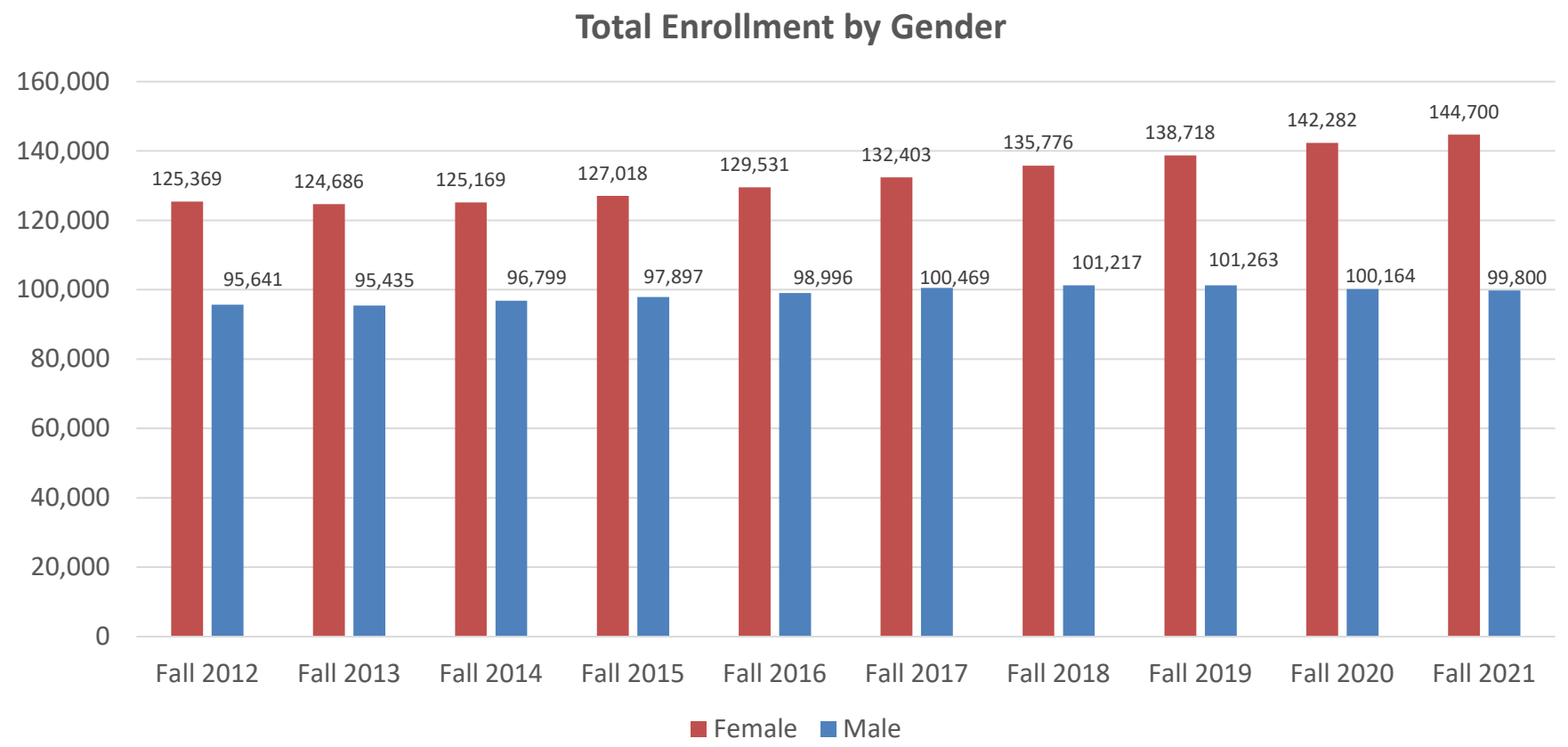
Enrollment Growth in the UNC System



	Fall 2012	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021
Undergraduate	175,760	175,328	177,744	180,376	182,465	185,880	189,890	191,632	192,170	191,510
Graduate	45,250	44,793	44,224	44,539	46,062	46,992	47,103	48,349	50,276	52,990
Total	**221,010**	**220,121**	**221,968**	**224,915**	**228,527**	**232,872**	**236,993**	**239,981**	**242,446**	**244,500**

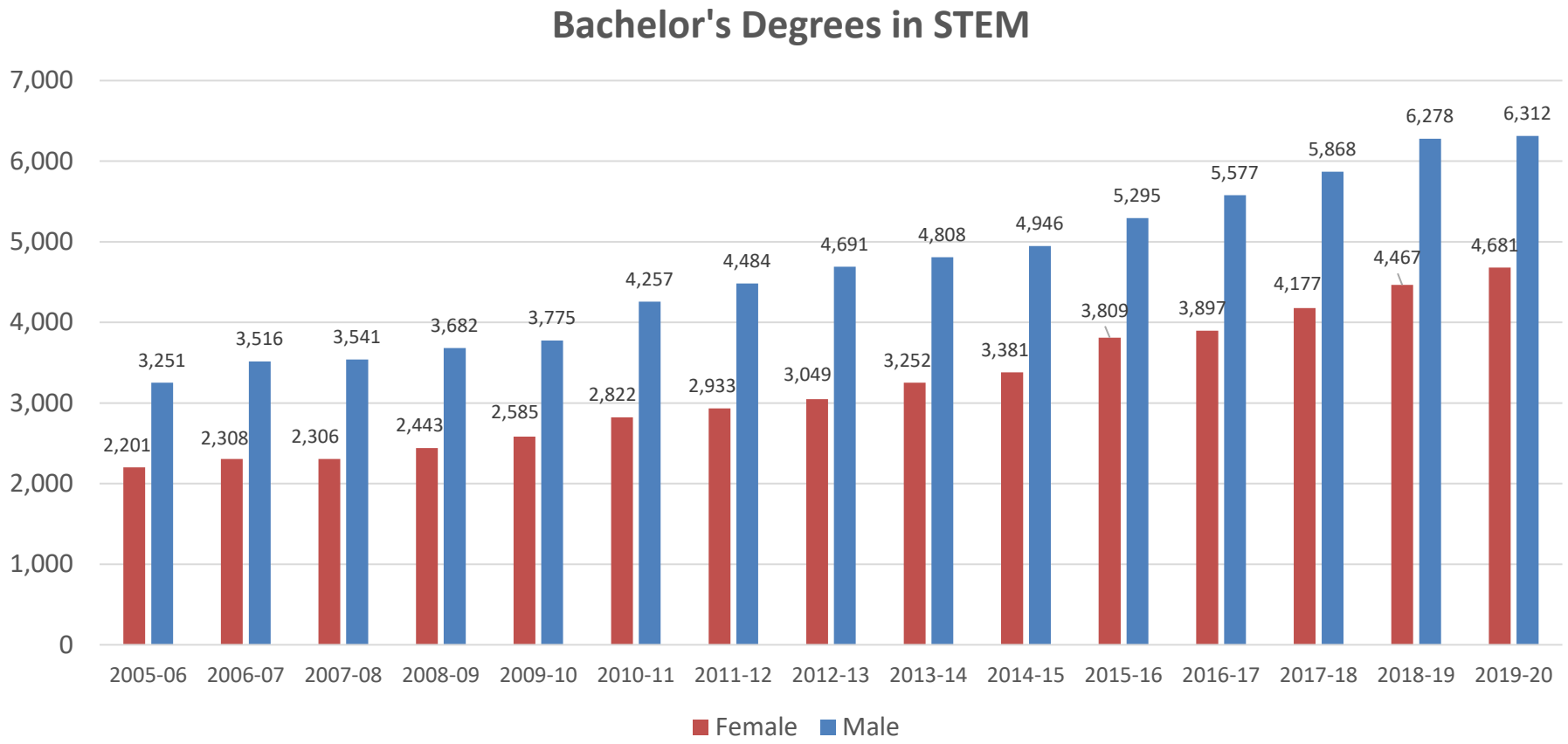
- UNC System has grown 10.6% over the past decade, bucking national trends

Enrollment Growth by Gender



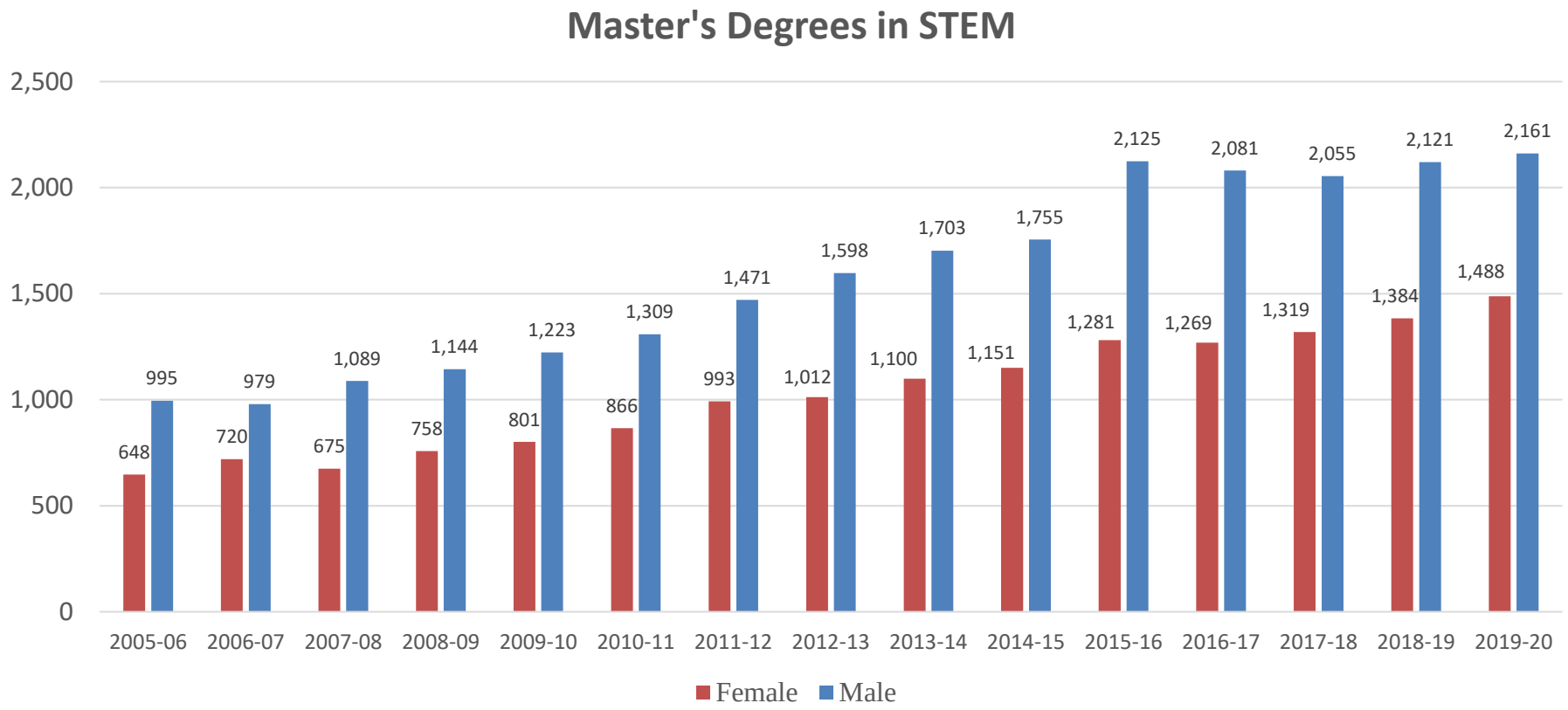
- Total female enrollment surpassed total male enrollment in 1979-80
- Female enrollment has grown by 15% over the past decade, compared to 4.3% for male enrollment
- Total female enrollment is now 1.5 times total male enrollment

STEM Degrees Produced by Gender



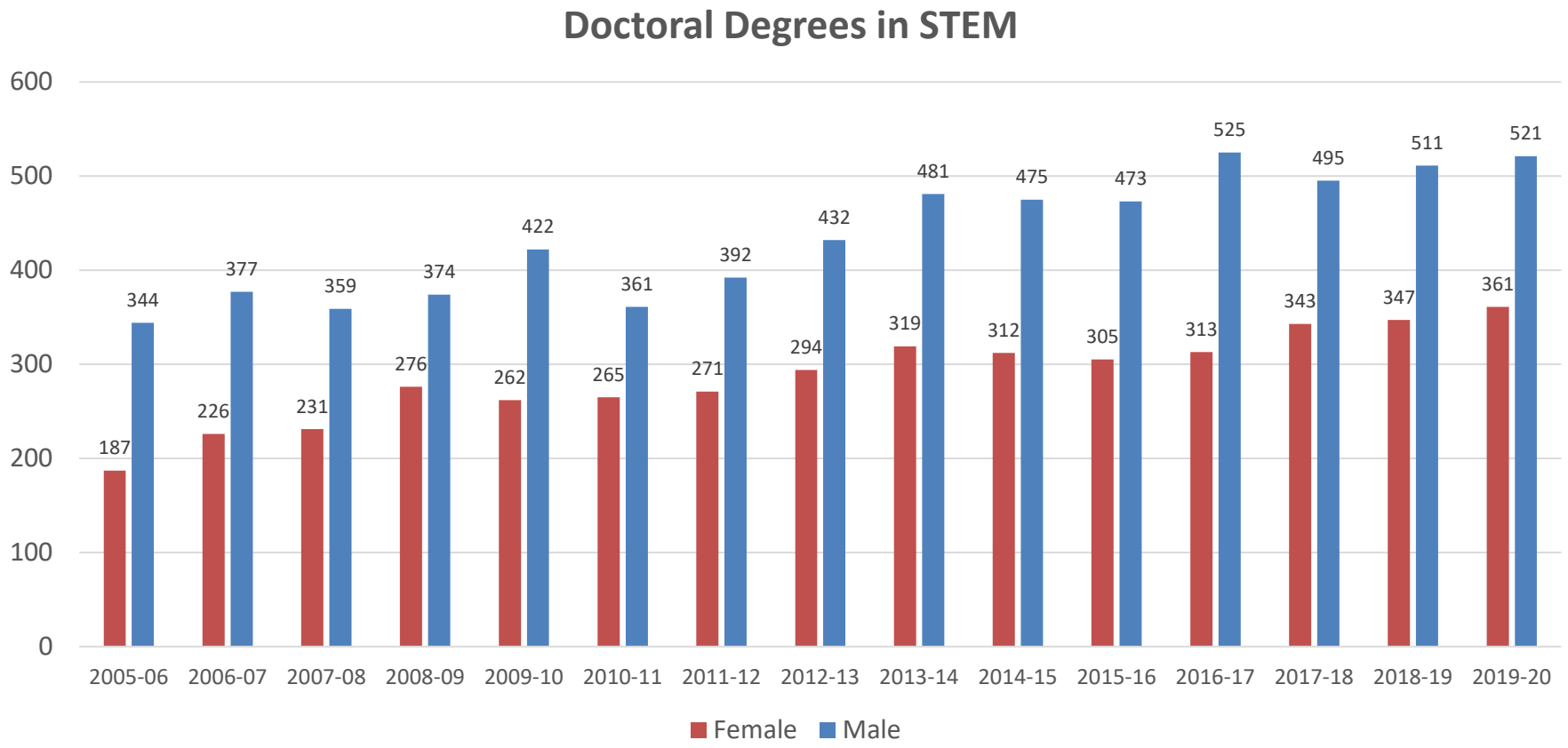
- Bachelor's degrees in STEM have grown consistently over the past fifteen years
- Female growth has outpaced male growth across the time period
- Since 2010-11, female bachelor's degrees in STEM have increased 66% compared to 48% for male bachelor's degrees in STEM

STEM Degrees Produced by Gender



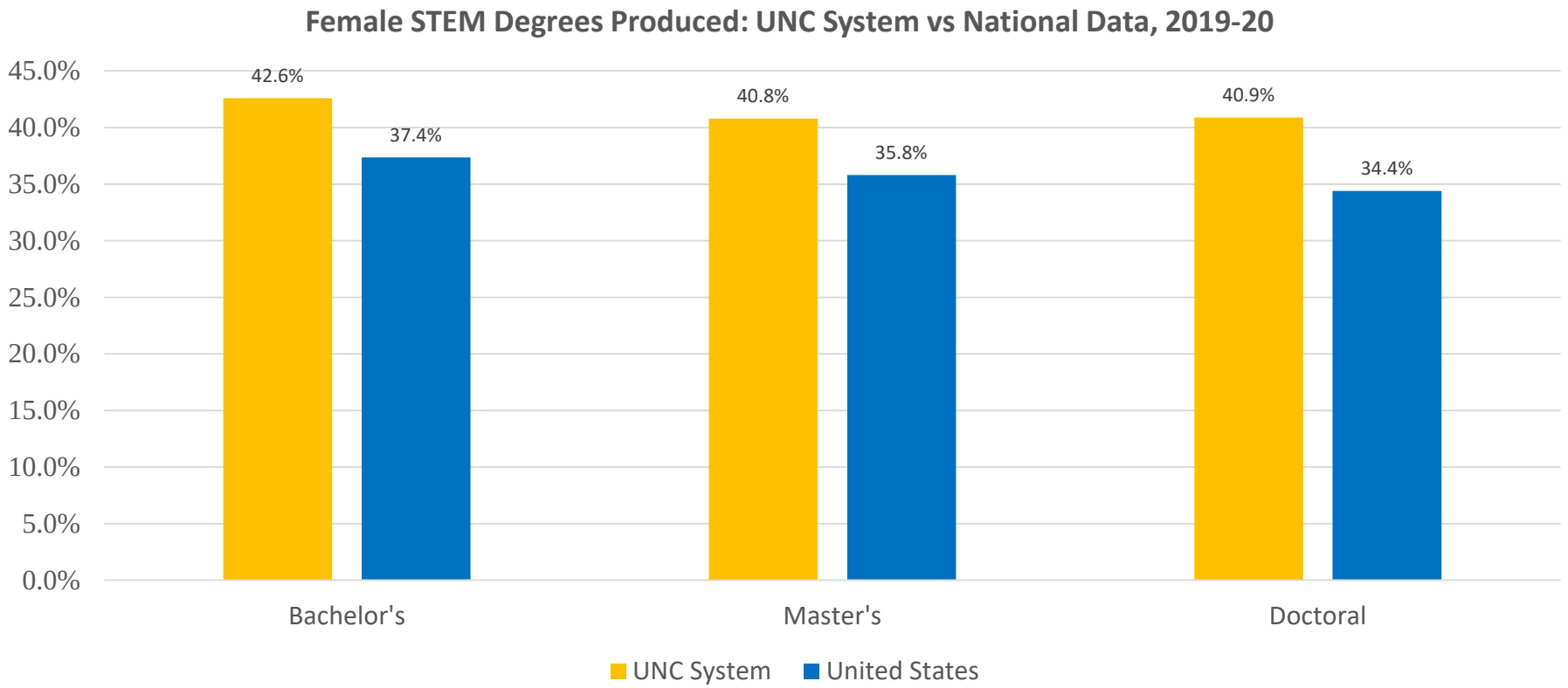
- Master's degrees in STEM have grown consistently over the past fifteen years
- Female growth has outpaced male growth across the time period
- Since 2015-16, female master's degrees in STEM have increased 16% compared to 1.7% for male master's degrees in STEM

STEM Degrees Produced by Gender



- Doctoral degrees in STEM have grown consistently over the past fifteen years
- Female growth has outpaced male growth across the time period
- Since 2005-06, female doctoral degrees in STEM have increased 93% compared to 52% for male doctoral degrees in STEM

Female STEM Degrees Produced



- Female STEM degrees produced as a percentage of all STEM degrees is higher in the UNC System than national data at the bachelor's, master's, and doctoral level
- *Source:* National Center for Education Statistics. (2021, September). Table 318.45. Number and percentage distribution of science, technology, engineering, and mathematics (STEM) degrees/certificates conferred by postsecondary institutions, by race/ethnicity, level of degree/certificate, and sex of student

UNC System Strategic Plan, 2022-2027

- **By 2026-27, increase the number of Health Sciences and STEM degrees and certificates awarded across the UNC System**
  - Baseline: 26,957
  - Target: 33,000
  - Stretch: 38,000

- **Increasing STEM degree production has been a top-line strategic plan objective since 2017**

Thank you!

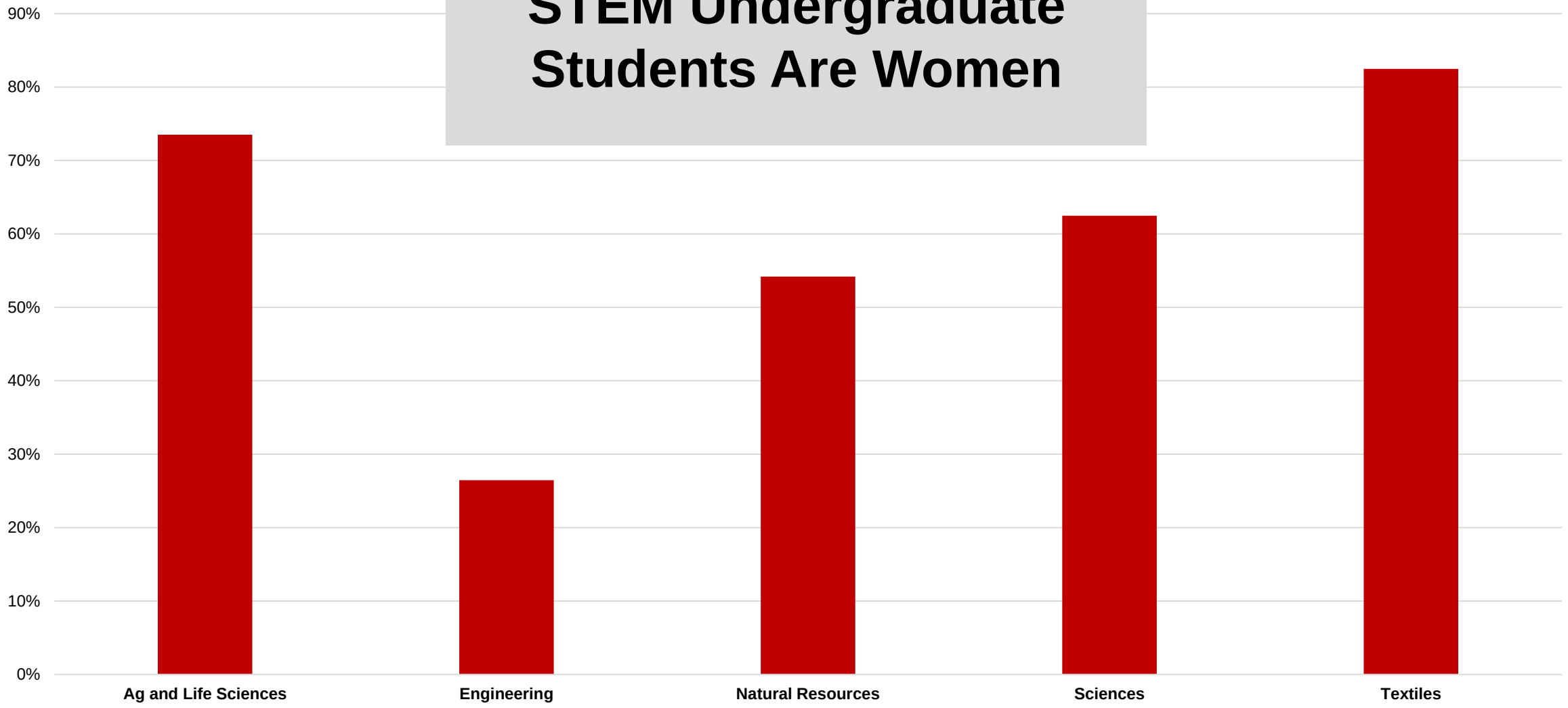
- Discussion
- Questions
- Follow-up

Advancing Women in STEM:
An Engineering Perspective

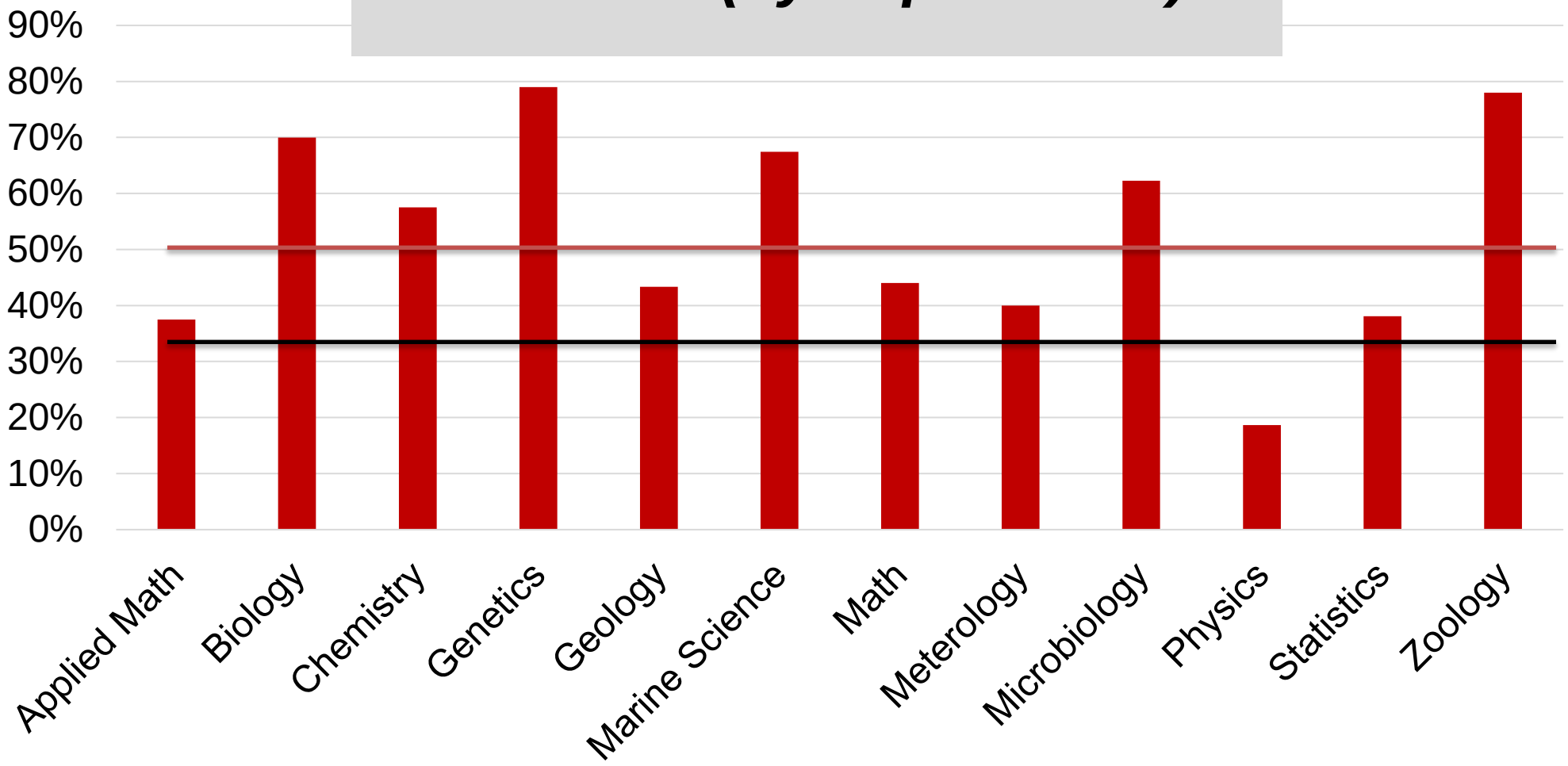
Dr. Laura J. Bottomley
Director, Women in Engineering and The Engineering Place
Director, Engineering Education
NC State College of Engineering

NC State visit to GE Aviation

At NC State, 46% of Our STEM Undergraduate Students Are Women



Percentage of Women in the College of Sciences at NC State *(by department)*



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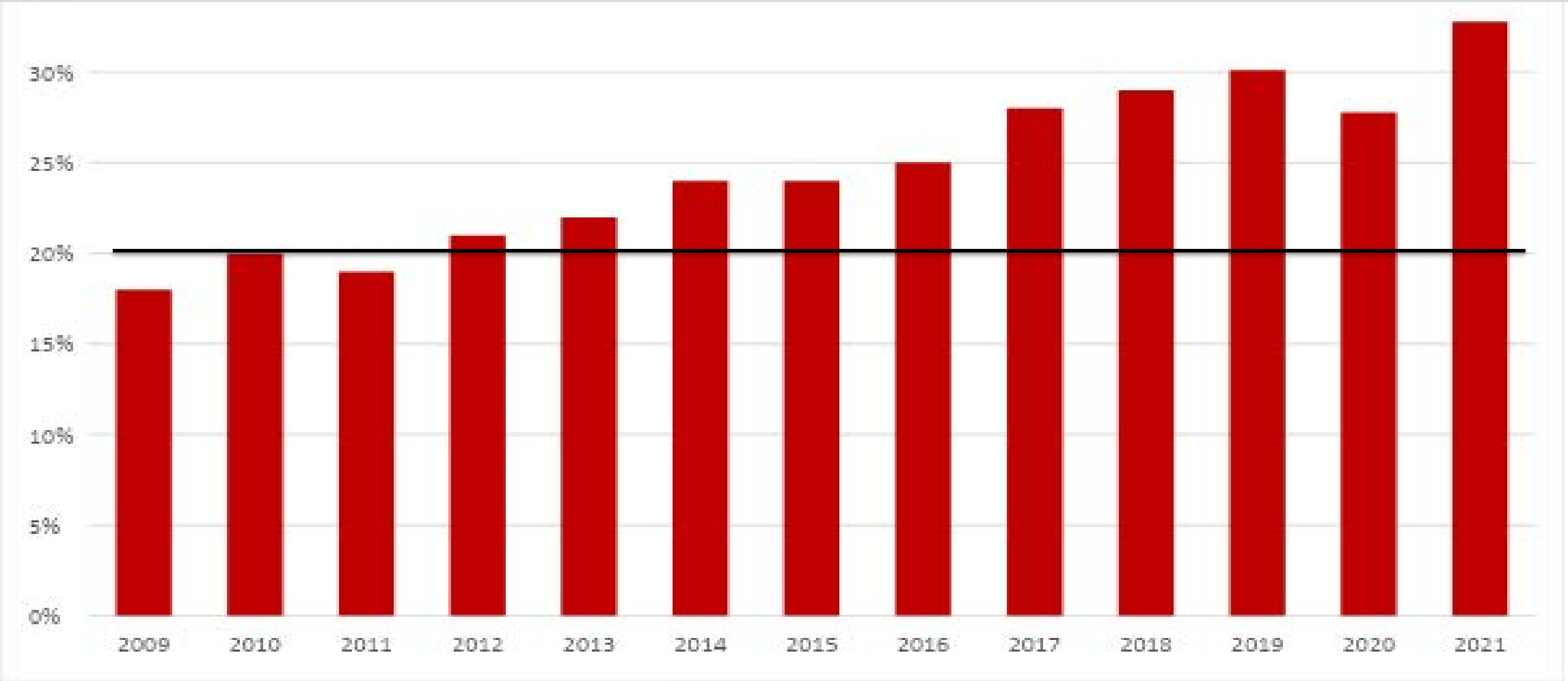
Awarding engineering bachelor degrees to women

Among U.S. top, public universities

Source: ZDNET

Percentage of NC State Engineering Undergraduates Who Are Women *(by entering class)*



It is not enough to enroll more women. We also need to graduate them.

- Of the women in engineering who started in 1995, **38.5%** of them graduated in engineering and **65.8%** of them graduated at NC State.
- Of the women in engineering who started in 2017, **72.7%** of them graduated in engineering, and **90.7%** of them graduated at NC State.

This didn’t happen overnight.

- Sarah Rajala, the first female tenured engineering faculty member at NC State hired Laura Bottomley as Director of Women in Engineering in 1997, with National Science Foundation (NSF) support.
- We took a hard look at the things being done around the country and decided to take a different path.
- The Women in Science and Engineering (WISE) Living and Learning Community was started in 2002 as a collaboration of the five STEM Colleges.
- We began to realize that the “pipeline” model was restricting progress. We shifted the focus from changing the students to fit the mold, to changing the climate of the College to include the students.
- Dean Louis Martin-Vega changed the paradigm on faculty hiring processes.

25 Years of Women in Engineering

We strive to create an environment from the beginning that this is where our female students belong, so they can see a clear pathway toward their future when they set foot on campus.

- Change the climate, not the student
- Industry partnerships: John Deere, Eastman, Microsoft, Caterpillar, and more

Women in Science and Engineering (WISE) Living and Learning Community

- 370 first and second year women and upper class mentors
- Helping women in STEM feel at home at NC State and engage in focused inquiry within their disciplines to help them achieve their educational and career goals

Purposeful and Concerted Efforts to Recruit and Retain Women Leaders

- From 10 to over 80 women faculty
- Three of our nine department heads are now women
- Women faculty lead major engineering research centers and efforts
- For women to aspire to have careers in engineering, they need existence proofs

SSIST
Transformative technologies for personalized, vigilant health monitoring

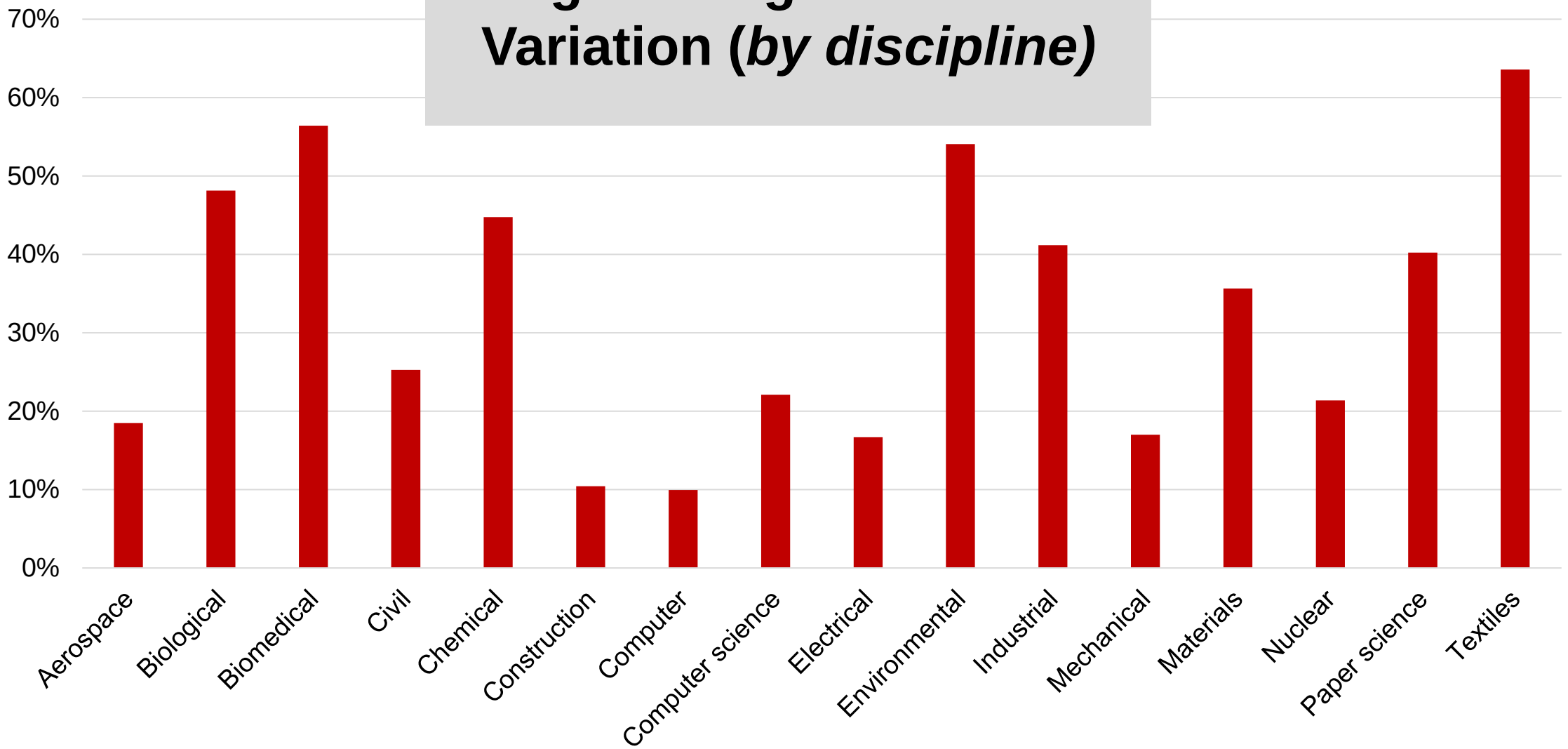
The Engineering Place for K–20 Outreach

- At NC State, we begin exposing students to engineering ways of thinking *at age 4*
- Over 250,000 North Carolina students served, preK – 12th grade
- Engineering summer camps, Family STEM nights, Bits and Bytes

Educational Partnerships

- Wake County STEM Early College High School has a curriculum based on the National Academy of Engineering (NAE) Grand Challenges for Engineering and has 50% girls enrolled.
- The NC Community College System represents alternative pathways for students to transfer into engineering programs.
- Brentwood Engineering Magnet School in Wake County introduces engineering thinking from kindergarten.
- Our new Engineering Education program is a partnership between the Colleges of Engineering and Education that will prepare educators to teach college and university level engineering classes.

NC State College of Engineering Enrollment Variation (*by discipline*)



Our Future Goals

- Half of our engineering students are women.
- Women are equally distributed across the disciplines.
- Half of our engineering faculty are women.

Challenges and Barriers:

Change does not happen overnight

- We are making an effort to destroy myths.
- Industry is behind the curve in creating a positive climate for women.
- Institutional change requires communication and dedication.

Final Thoughts

- We need more programs for young girls and women in STEM that reflect the reality of the fields.
- We need to remember that, above all, engineering is a human endeavor, and not just a set of tools or equations.
- We need to create opportunities for more young women to access an engineering education at all levels.

NC STATE UNIVERSITY

Thank you for your support of
Engineering North Carolina's Future.

4,000 More Students

$20 Million for Faculty and Staff

$30 Million for Facility Upgrades

Questions?

SHARING A SUCCESS STORY: ADVANCING WOMEN IN STEM AT NCA&T

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Dr. Stephanie Luster-Teasley
Interim Dean, College of Engineering

9/7/2022

NC A&T ADVANCE IT Project

Catalyzing Gender, Leadership, and Scholarship Equity through Institutional Change for All

(NSF Award Number: 1409799)

National Science Foundation

Our Story: Background

2013

- Institutional climate survey showed that the two most **prominent challenges**
  - **Obstacles to promotion and representation at the rank of full professor**
  - **Difficulty in establishing and sustaining research.**

2014

- Only **62 of 245** of tenured and tenure-track STEM/SBS faculty were women (25%)
- 12 STEM women were full professors (5%)
- Women were less likely to be PIs for grants and predominately were investigators
- High teaching, high service obligations, administrator roles as directors but not upper tier leadership positions

ADVANCE IT Leadership Team

Original PIs/Co-PI (2014)

Provost Joseph Whitehead (PI)

Dr. Goldie Byrd (Co-PI)
Former Dean, Arts and Sciences

Dr. Zakiya Wilson (Co-PI)
Associate Dean, Arts and Sciences

Dr. Beryl McEwen
Former Provost and Executive Vice Chancellor for Academic Affairs, PI

Dr. Tonya Smith-Jackson
Interim Provost and Executive Vice Chancellor for Academic Affairs, PI

Dr. Robin N. Coger
Engineering
Co-PI

Dr. Stephanie Luster-Teasley
Engineering
Co-PI

Dr. Margaret Kanipes
Chemistry
Co-PI

Dr. Anna Lee
Psychology
Co-PI

Dr. Sherrice Allen
Director,
NC A&T ADVANCE IT
Biology

Goals

- To catalyze and implement approaches that significantly increase the representation and career advancement of women in STEM and SBS disciplines at North Carolina A&T State University.
- To fill knowledge gaps on the empowerment and equity of women in the academy.

Institutional transformation, via an **empowerment approach**, has positively impacted women and men faculty across the entire campus of NC A&T by enhancing the research/leadership capabilities of faculty leading to an increase in their overall professional achievements.

Target Outcomes

- Address gender inequities on campus for women in STEM by catalyzing university-wide systemic changes that increase the representation of women at all levels.
  - Interventions
  - Policy and Climate
  - Recruitment/Hiring
  - Professional development
  - Women in Leadership
- Design ADVANCE IT initiatives for high impact for all faculty
- Sustainable Institutional Transformation

ADVANCE IT Project - Objectives

Objective 1	• *Increase recruitment, retention and advancement of women in STEM/SBS at N.C. A&T by building a strategic pipeline for academic and professional success.*
Objective 2	• *Increase opportunities for sustained achievement for all faculty by creating a whole campus culture of excellence in STEM research and scholarship*
Objective 3	• *Increase the knowledge of roles of gender and gender/race intersectionality within the academy*

Initiatives

*Blue – Women focused Initiatives

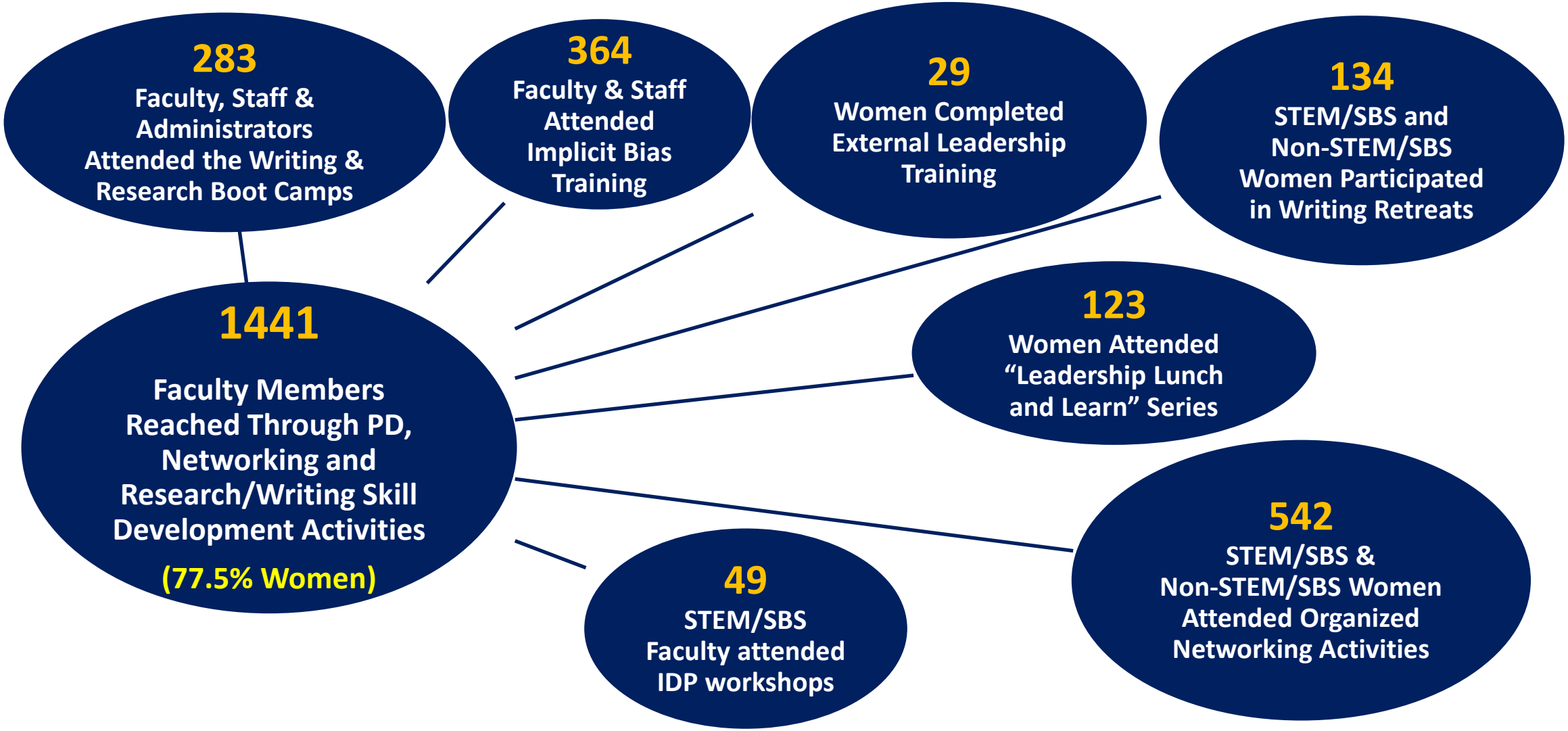
- ADVANCE IT Faculty Scholars Program
- STEM Women's Writing Retreat
- Writing Accountability Groups (WAGs)
- Individual Development Plan for Jr Faculty
- Biennial Writing & Research Boot Camp
- Tenure and Promotion Workshop
- Informal Group Mentoring and Coaching Sessions

- Equity and Inclusion Interactive Theatre Workshops for Search Committees
- Women and Minority Faculty Recruitment Directory
- ADVANCE IT Recruitment Grant for women candidates

- Chairs Leadership Development Series
- Sponsorship for External Leadership Training
- Women in Higher Education Leadership and Mentoring Conference

- Implementation of Faculty Climate Surveys
- Promote Polices, Procedures and Practices that Support Gender Equity
- Gender Equity & Leadership (GEL) Faculty Advocates

Training and Development of All Faculty by the Numbers



ADVANCE IT Key Initiatives

Success in Retention/Advancement

- ADVANCE IT Scholars: **27 scholars in 3 cohorts**
- Connected cohort of STEM/SBS women faculty
  - Formation of a supportive network of likeminded faculty
  - Safe outlet to share concerns and obtain strategies for navigating departmental culture
  - Increased retention and advancement rates
  - Enhanced competitiveness for leadership
  - Equipped to navigate the tenure & promotion process
  - Formation of interdisciplinary collaborative writing & research groups
- Advancement of women in research funding as PIs, award nominations and recognition, scholarship, and leadership roles
- Data supporting the advancement of women from Assistant to Associate to Full

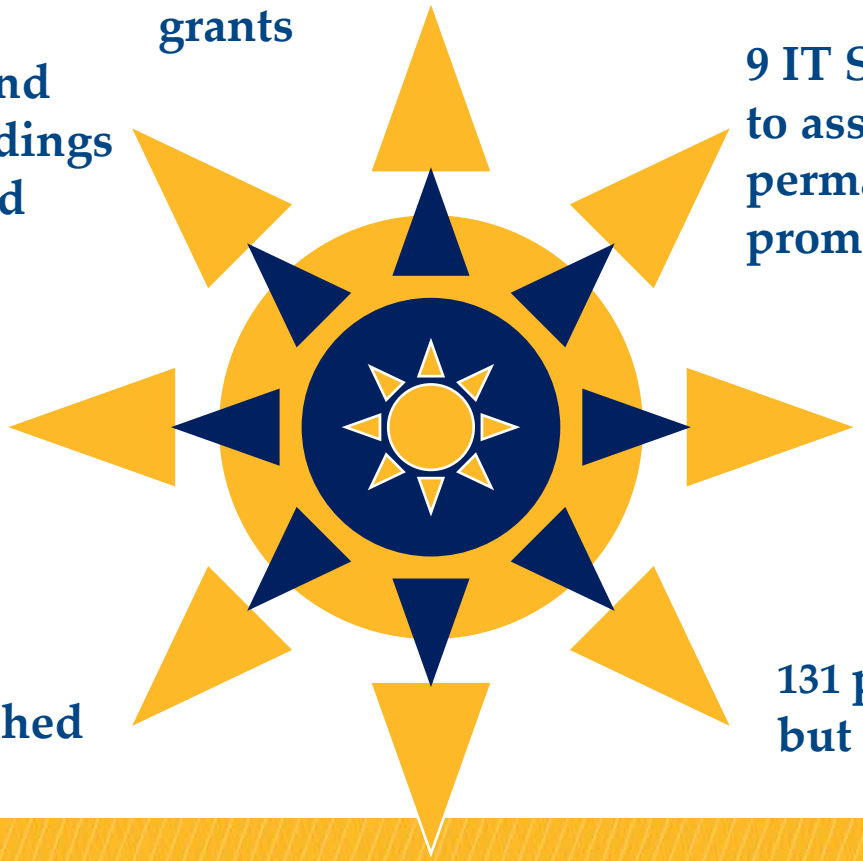
ADVANCE-IT Scholars Milestones

27 women scholars from June 2015 – June 2021

$42,219,171 grant funding secured from a total of 127 grants

224 publications and conference proceedings accepted/published

9 IT Scholars were promoted to associate professor w permanent tenure and 3 promoted to full professor.



35 publications and conference proceedings submitted and/or under review

Scholars attended or presented work at 245 professional conferences

7 books published

131 proposals submitted but not funded

STEM/SBS Women Faculty Retention and Advancement Statistics

Academic Year	STEM/SBS Women Faculty (All ranks)	Tenured & Tenure Track Women Faculty	STEM/SBS Women Full Professors	STEM/SBS Women Associate Professors	STEM/SBS Women Assistant Professors
2014 – 2015	71	62	12	30	20
2020 – 2021	135	75	16	29	30

Outcomes of ADVANCE Activities

ADVANCE IT Key Initiatives

Success in Leadership

- Increased from 12 Full professor women faculty to 16 Full professor women faculty
- 67% of STEM women chairs are full professors
- Three (3) women moved to Tier 1 administrative positions
  - Provost and Vice Chancellor of Academic Affairs
  - Senior VP for Academic Affairs
  - VP for Undergraduate Education
- 29 women completed external leadership training across various events including: BRIDGES, HERS Institute, Fielding Leadership Summit, STEM Women of Color Conclave
- Women's History Month Celebration and Networking Luncheon
- "Empowered to Lead" Women in Higher Education Leadership and Mentoring Conference

ADVANCE IT Key Initiatives

Success in Policy/Climate

- Faculty Handbook Revision
- Faculty Senate completed the rewriting of the faculty handbook, with member of ADVANCE team in service on committee; the Provost (PI) had active engagement in this process.
- Faculty Climate Survey
- Conducted three (3) iterations of the climate survey (2014, 2017 and 2021)
  - Results are being used to guide the development of an institutional transformation strategic plan and policy development
- Gender Equity & Leadership (GEL) Faculty Advocates
  - Project: Analyzing Faculty Workloads and RPT Policies through an Equity Lens

ADVANCE IT Key Initiatives

Success in Recruitment

- Search Committee Certification – required for all SHRA/ERHA who participate in search committees (450 employees certified)
- Two implicit bias focused workshops have been developed:
  - Faculty Hiring process: “The Perfect Fit”
  - Tenure & Promotion process: "Tenure and Promotion, The Play”
- Gender equity data statistics tracked annually and has become an institutional practice

Recommendations

- Fostering an environment and climate structures to support women in STEM and the pipeline of women entering STEM
- Role models
- Establishing communities (safe spaces) and work/life integration
- Active recruitment of women in STEM into higher education, industry, and government
- Addressing policy changes for gender equity
- Nomination, sponsorship, and selection of women in STEM for leadership roles, scholarly awards, and administration
- Professional development and leadership training
- Track the data

Thank you from the NCA&T ADVANCE IT Leadership Team

Catalyzing Gender, Leadership, and Scholarship Equity through Institutional Change for All

NSF Award Number: 1409799

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