Preparing the Engineer of 2020:
Survey of Undergraduate Education Administrators

Personal Information

For the following questions, please check the appropriate response and fill in the blanks where indicated.

1. **What is your gender?**

   ○ Man
   ○ Woman

2. **Are you (check all that apply):**

   ○ African American   ○ Caucasian/White
   ○ Asian American   ○ Foreign National
   ○ Hispanic or Latino/a American   ○ Naturalized U.S. Citizen
   ○ Native American   ○ Other (please specify) _____

3. **How many years have you worked at this institution?** _____ years

4. **How many years have you served in the following roles, <u>at this or any other institution</u>? (Positions may overlap)**

   Dean   _____ years

   Associate dean   _____ years

   Program or department chair   _____ years

   Faculty member   _____ years

   Curriculum or program coordinator   _____ years

   Undergraduate advising coordinator   _____ years

   Curriculum committee member or chair   _____ years

   ABET self-study team member   _____ years

5. **In what field is your:**

	Highest Degree	Primary Department
Aerospace engineering	○	○
Agricultural engineering	○	○
Bio-medical/Bio-engineering	○	○
Chemical engineering	○	○
Civil engineering	○	○
Computer engineering/Computer science	○	○
Electrical engineering	○	○
Environmental engineering	○	○
General engineering/Engineering science	○	○
Industrial engineering	○	○
Metallurgical/Materials engineering	○	○
Mechanical engineering	○	○
Nuclear engineering	○	○
Other (please specify)	_____	_____

6. **How many years have you worked <u>as an engineer </u>outside of higher education (e.g., industry, government, self-employed)?**   _____ years

7. <u>**In an average year**</u>**, approximately what percentage of your administrative time is spent on the following curricular, instructional, or other related educational matters?**

    Curriculum planning, development, or revision   _____ %

    Reviewing academic programs   _____ %

    Meeting with department chairs regarding curricular/instructional matters   _____ %

    Meeting with engineering student services staff   _____ %

    Working with faculty preparing grants to improve undergraduate education   _____ %

    Meeting with academic administrators outside engineering on curricular matters   _____ %

    Other(please specify) _____   _____ %

    *Does not have to sum to 100%

Your Undergraduate Engineering Programs

8. **When do undergraduates enter the engineering college or unit? By when must they declare their major?**

	Enter engineering college/unit:	Declare engineering major:
In their first year	O	O
In their sophomore year	O	O
In their junior year	O	O
Not applicable	O	

9. **Are most faculty members part of your formal undergraduate advising system?**

    - O No; professional staff advise all undergraduates. *Skip to question 11.*
    - O Yes, for both pre-major and major students. *Go to question 10.*
    - O Yes, but only for engineering majors. *Go to question 10.*
    - O Yes, but only for pre-majors. *Go to question 10.*

10. **Are faculty advisors:**

	<u>No</u>	<u>Systematically</u>	<u>Informally</u>
Provided training and support	O	O	O
Evaluated based on their performance	O	O	O
Rewarded in salary or promotion & tenure decisions	O	O	

11. **Does your college have an "early alert system" to identify students having:**

	<u>No</u>	<u>Yes, it's informal</u>	<u>Yes, it's systematic</u>
Academic difficulties	O	O	O
Personal difficulties	O	O	O

12. Does your engineering college or unit offer minors or certificates in the following areas (check all that apply)?

    O   Entrepreneurship   O   Design   O   Leadership   O   Sustainability

    O   Other(s) _____

13. Are cooperative education experiences for undergraduates:

    O   Required in all programs
    O   Required in some programs
    O   Not required in any programs
    O   Not available

14. <u>Excluding the engineering accreditation process</u>, is there a formal, periodic review of your undergraduate programs (check all that apply)?

    O   No   O   Yes, it's required by my institution
    O   Yes, it's required by my engineering college or unit   O   Yes, it's required by the state

15. How much do you rely on the following in formal or informal program reviews (<u>excluding</u> accreditation)?

	Little/not at all	Slightly	Moderately	A great deal
Student ratings of instruction	O	O	O	O
Assessment data on student learning	O	O	O	O
External peer reviews	O	O	O	O
Alumni surveys	O	O	O	O
Industry feedback or representatives	O	O	O	O
Benchmarking	O	O	O	O
Other (please specify) _____	O	O	O	O

16. Does your unit, college, or institution offer/have (check all that apply):

	Engineering-specific	Institution-wide
Supplemental instruction	O	O
Tutoring center or services	O	O
Advising center	O	O
Bridge program(s) for underrepresented students	O	O
Cooperative education or internship staff	O	O
Learning communities for students	O	O
Coordinator/director of minority student affairs	O	O
Coordinator/director of services for women students	O	O
Career services	O	O
Collaborative programs with, or outreach to, K-12 schools	O	O
Summer programs for elementary, middle, or high school students	O	O

17. How much does your engineering college or unit rely on student learning data for:

	Not at all	Slightly	Moderately	Very much	Extremely
Course redesign	O	O	O	O	O
Course development	O	O	O	O	O
Curriculum review and development	O	O	O	O	O
Continuous improvement processes	O	O	O	O	O
Faculty performance reviews	O	O	O	O	O
Resource distribution	O	O	O	O	O

18. How much do the following <u>limit</u> your engineering college or unit's ability to improve its undergraduate programs?

	Not at all	Slightly	Moderately	Very much	Extremely
Outdated lab equipment	O	O	O	O	O
Space or facilities constraints	O	O	O	O	O
Faculty stretched too thin	O	O	O	O	O
Faculty apathy	O	O	O	O	O
Lack of support staff (e.g., clerical, technical, laboratory)	O	O	O	O	O
Emphasis on research in reward system	O	O	O	O	O
Lack of teaching assistantships	O	O	O	O	O
High student-faculty ratios	O	O	O	O	O
ABET requirements	O	O	O	O	O
Institution-wide curriculum requirements	O	O	O	O	O

Faculty Support

19. Approximately what percent of your pre-major and major undergraduate engineering courses:

	Pre-major courses	Major courses
Have a graduate teaching assistant as the <u>primary</u> instructor	_____ %	_____ %
Have a graduate teaching assistant who supports the instructor	_____ %	_____ %
Are taught by a fixed-term, nontenure-track instructor	_____ %	_____ %

20. Do you have an orientation session for:

	Yes	No
New fixed term instructors	O	O
Graduate TAs	O	O
New tenure track faculty members	O	O

If yes for <u>new tenure track faculty members</u>, *go to question 21.* Otherwise *go to question 22.*

21. Approximately how many hours of the orientation session for new tenure-track faculty are devoted to:

Teaching   _____ hours

Research and grant-getting   _____ hours

22. In your opinion, what is the relative weight given to teaching versus research in your college/school of engineering:

Teaching ⟵——————————————⟶ Research

	1	2	3	4	5	6	7	Not applicable
Hiring decisions	○	○	○	○	○	○	○	○
Merit salary decisions	○	○	○	○	○	○	○	○
Promotion and tenure decisions	○	○	○	○	○	○	○	○

23. To what extent does the engineering college or school provide financial, logistical, or staff support for:

	Not at all	Slightly	Moderately	A great deal
Admissions office recruitment events	○	○	○	○
Recruiting community college students	○	○	○	○
Recruiting women students	○	○	○	○
Recruiting women faculty	○	○	○	○
Recruiting historically underrepresented students	○	○	○	○
Recruiting historically underrepresented faculty	○	○	○	○
Mentoring programs for undergraduate students	○	○	○	○
Mentoring programs for new faculty members	○	○	○	○

24. Do you agree or disagree with the following statements?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable
In general, our programs carefully consider teaching ability when hiring faculty.	○	○	○	○	○	
Promotion and tenure in engineering is based primarily on research productivity.	○	○	○	○	○	
Research on engineering education counts in our promotion and tenure process.	○	○	○	○	○	
Our programs encourage innovative educational practices.	○	○	○	○	○	
My college provides few incentives for undergraduate course development.	○	○	○	○	○	
Graduate students who want to be engineering faculty should receive formal training in teaching.	○	○	○	○	○	
Excellent teaching is recognized in merit salary increases.	○	○	○	○	○	○
My institution's teaching and learning center is a good place to go when faculty want to improve their teaching.	○	○	○	○	○	○

Views of Engineering and Engineering Education

25. **Several recent reports discuss the changing knowledge and skills engineers will need in the future and how engineering education needs to change. Do you agree or disagree with the following statements about <u>undergraduate engineering education</u>?**

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Programs must periodically revise curricula so students are aware of new technologies.	○	○	○	○	○
Emphasizing professional skills takes time away from teaching technical content.	○	○	○	○	○
Humanities and social science courses are <u>very</u> important in preparing engineers.	○	○	○	○	○
Students' leadership skills are best developed in extra-curricular activities.	○	○	○	○	○
Interdisciplinary learning – inside and outside engineering – should be part of the engineering curriculum.	○	○	○	○	○
The engineering workplace requires systems thinking.	○	○	○	○	○
Concepts of sustainability should be a major focus of the undergraduate curriculum.	○	○	○	○	○
It's very difficult to increase enrollments of women students without sacrificing some academic standards.	○	○	○	○	○
It's very difficult to increase enrollments of minority students without sacrificing some academic standards.	○	○	○	○	○

26. **Do you agree or disagree that <u>the undergraduate engineering curriculum should</u>:**

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Teach students about intercultural communication.	○	○	○	○	○
Start hands-on design in the first year and continue it throughout the program.	○	○	○	○	○
Teach students to consider all relevant factors (e.g., social, cultural, environmental) in designing solutions.	○	○	○	○	○
Cultivate student creativity.	○	○	○	○	○
Prepare students to assume community leadership roles.	○	○	○	○	○
Teach students learning strategies.	○	○	○	○	○
Prepare students to work effectively across national and cultural boundaries.	○	○	○	○	○
Address ethical issues in multiple courses .	○	○	○	○	○
Develop students who can think like entrepreneurs.	○	○	○	○	○
Provide opportunities for students to prepare for occupations other than engineering (e.g., business, medicine, law).	○	○	○	○	○

27. Do you agree or disagree that <u>engineering programs should</u>:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Reward excellence in teaching commensurately with research.	○	○	○	○	○
Reward faculty who do peer-reviewed <u>engineering education</u> research.	○	○	○	○	○
Take responsibility for working with community colleges to facilitate student transfer.	○	○	○	○	○

28. How familiar are you with the following National Academy of Engineering reports?

	Unaware of it	Heard of it	Read/heard summaries	Read parts	Read most or all
The Engineer of 2020: Visions of Engineering in the New Century	○	○	○	○	○
Educating the Engineer of 2020: Adapting Engineering Education to the New Century	○	○	○	○	○
Rising above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future	○	○	○	○	○

29. Please provide any additional comments that will help us understand your undergraduate engineering program (attach addition sheets if necessary).

Thank you *very* much for your participation!

Please return the survey in the postage-paid envelope provided

Please direct questions about this survey to:

Dr. Betty J. Harper
Senior Project Associate
(814) 863-0854
BHarper@psu.edu

Center for the Study for Higher Education
The Pennsylvania State University
400 Rackley Building
University Park, PA 16802