

## Preparing the Engineer of 2020

### Survey of 2006 Graduates



This study is funded by the National Science Foundation and endorsed by the following associations and professional engineering societies:



# Educating the Engineer of 2020 Alumni Survey

## PERSONAL INFORMATION

**1. What was your undergraduate major?**

- |   |   |
|---|---|
| <input type="radio"/> Bio-medical/Bio-engineering | <input type="radio"/> General engineering/Engineering Science |
| <input type="radio"/> Chemical engineering        | <input type="radio"/> Industrial engineering                  |
| <input type="radio"/> Civil engineering           | <input type="radio"/> Mechanical engineering                  |
| <input type="radio"/> Electrical engineering      | <input type="radio"/> Other (please specify): _____           |

**2. When you entered the institution where you earned your bachelor's degree, were you a:**

- First-time college student
- Transfer student with an associate's degree from a community or two-year college
- Transfer student without an associate's degree from a community or two-year college
- Transfer student from a four-year institution
- "3+2 program" transfer from another four-year institution

**3. What is your gender?**

- Man
- Woman

**4. Are you: (Please select all that apply.)**

- |   |   |
|---|---|
| <input type="radio"/> African American              | <input type="radio"/> Caucasian/White                               |
| <input type="radio"/> Asian American                | <input type="radio"/> Foreign national (citizen of another country) |
| <input type="radio"/> Hispanic or Latino/a American | <input type="radio"/> Naturalized U.S. citizen                      |
| <input type="radio"/> Native American               | <input type="radio"/> Other (please specify): _____                 |

| 5. What is the <u>highest level</u> of formal schooling that each of your parents/guardians have completed? (Mark <b>ONLY ONE</b> oval per column). | Mother/<br>Guardian   | Father/<br>Guardian   |
|---|-----------------------|-----------------------|
| Did not finish high school  | <input type="radio"/> | <input type="radio"/> |
| High school graduate/GED  | <input type="radio"/> | <input type="radio"/> |
| Attended college but did not receive a degree   | <input type="radio"/> | <input type="radio"/> |
| Vocational/technical certificate or diploma   | <input type="radio"/> | <input type="radio"/> |
| Associate or other 2-year degree  | <input type="radio"/> | <input type="radio"/> |
| Bachelor's or other 4-year degree   | <input type="radio"/> | <input type="radio"/> |
| Master's degree (M.A., M.S., M.B.A., etc.)  | <input type="radio"/> | <input type="radio"/> |
| Doctorate degree (Ph.D., J.D., M.D., etc.)  | <input type="radio"/> | <input type="radio"/> |

6. Did you take the SAT or ACT tests? (Please select all that apply.)

No. I did not take either exam.

Yes, I took the SAT exam, and my scores were approximately:

SAT Verbal

SAT Math

Yes, I took the ACT exam, and my Composite score was approximately:

7. What was your approximate overall academic average in high school and in your engineering program?

|                          | High School           | Engineering Program   |
|--------------------------|-----------------------|-----------------------|
| 1.49 or below (below C-) | <input type="radio"/> | <input type="radio"/> |
| 1.50 - 1.99 (C- to C)    | <input type="radio"/> | <input type="radio"/> |
| 2.00 - 2.49 (C to B-)    | <input type="radio"/> | <input type="radio"/> |
| 2.50 - 2.99 (B- to B)    | <input type="radio"/> | <input type="radio"/> |
| 3.00 - 3.49 (B to A-)    | <input type="radio"/> | <input type="radio"/> |
| 3.50 or above (A- to A)  | <input type="radio"/> | <input type="radio"/> |
| Not applicable           | <input type="radio"/> | <input type="radio"/> |

**ENGINEERING SKILLS**

**Instructions:** In the following section, you will be asked to think about your level of ability in college when you were a graduating senior and your current level of ability. If you're unfamiliar with, or have had no experience with, any of the following, select the "Weak/none" option.

8. **Define Problems and Generate Design Solutions.** Please rate your ability to do each of the following (1) when you were a graduating senior (SENIOR YEAR) and (2) currently (NOW):

| SENIOR YEAR           |                       |                       |                       |                       | Ability to...  | NOW                   |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |  | 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | 1=Weak/none 2=Fair 3=Good 4=Very Good 5=Excellent  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Define design problems and objectives clearly and precisely.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Ask questions to understand what a client/customer really wants in a "product."  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Undertake a search (literature review, databases, benchmarking, reverse-engineering, etc.) before beginning team-based brainstorming.                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Take into account the design contexts (social, cultural, economic, environmental, political, ethical, etc.) and the constraints they may impose on each possible solution. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Generate and prioritize criteria for evaluating the quality of a solution.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| SENIOR YEAR           |                       |                       |                       |                       | Ability to...<br>1=Weak/none 2=Fair 3=Good 4=Very Good 5=Excellent  | NOW                   |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |   | 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Brainstorm possible engineering solutions.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Apply systems thinking in developing solutions to an engineering problem.                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Develop pictorial representations of possible designs (sketches, renderings, engineering drawings, etc.). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Evaluate design solutions based on a specified set of criteria.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Produce a product (prototype, program, simulation, etc.).   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

9. **Manage a Design Project.** Please rate your knowledge and ability in each of the following areas (1) when you were a graduating senior (SENIOR YEAR) and (2) currently (NOW):

| SENIOR YEAR           |                       |                       |                       |                       | Ability to...<br>1=Weak/none 2=Fair 3=Good 4=Very Good 5=Excellent                         | NOW                   |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |  | 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Break down a design project into manageable components or tasks.                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Identify team members' strengths/weaknesses and distribute tasks and workload accordingly. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Recognize when changes to the original understanding of the problem may be necessary.      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Monitor the design process to ensure goals are being met.                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Put aside differences within a design team to get the work done.                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

10. **Engineering Contexts.** Please rate your knowledge and ability in each of the following areas (1) when you were a graduating senior (SENIOR YEAR) and (2) currently (NOW):

| SENIOR YEAR           |                       |                       |                       |                       | Knowledge and Ability to...<br>1=Weak/none 2=Fair 3=Good 4=Very Good 5=Excellent  | NOW                   |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |   | 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Knowledge of contexts (social, political, economic, cultural, environmental, ethical, etc.) that might affect the solution to an engineering problem. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Knowledge of the connections between technological solutions and their implications for the society or groups they are intended to benefit.           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Ability to use what you know about different cultures, social values, or political systems in developing engineering solutions.                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Ability to recognize how different contexts can change a problem solution.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**11. Communication.** Please rate your ability to do each of the following (1) when you were a graduating senior (SENIOR YEAR) and (2) currently (NOW):

| SENIOR YEAR           |                       |                       |                       |                       | Ability to...<br>1=Weak/none 2=Fair 3=Good 4=Very Good 5=Excellent        | NOW                   |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |   | 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Write a well-organized, coherent report.                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Make effective audiovisual presentations.                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Construct tables or graphs to communicate a solution.                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Communicate effectively with clients, teammates, and supervisors.         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Communicate effectively with <u>non-technical</u> audiences.              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Communicate effectively with people from different cultures or countries. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**12. Teamwork.** Please rate your ability to do each of the following (1) when you were a graduating senior (SENIOR YEAR) and (2) currently (NOW):

| SENIOR YEAR           |                       |                       |                       |                       | Ability to...<br>1=Weak/none 2=Fair 3=Good 4=Very Good 5=Excellent                        | NOW                   |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |   | 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Work with others to accomplish group goals.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Work in teams of people with a variety of skills and backgrounds.                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Work in teams where knowledge and ideas from multiple engineering fields must be applied. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Work in teams that include people from fields <u>outside engineering</u> .                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**13. Leadership.** Please rate your ability to do each of the following (1) when you were a graduating senior (SENIOR YEAR) and (2) currently (NOW):

| SENIOR YEAR           |                       |                       |                       |                       | Ability to...<br>1=Weak/none 2=Fair 3=Good 4=Very Good 5=Excellent                       | NOW                   |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |  | 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Help your group or organization work through periods when ideas are too many or too few. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Develop a plan to accomplish a group's or organization's goals.                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Take responsibility for a group's or organization's performance.                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Motivate people to do the work that needs to be done.                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**14. Interdisciplinary Knowledge and Skills.** Indicate your level of agreement with the following (1) when you were a graduating senior (SENIOR YEAR) and (2) currently (NOW):

| SENIOR YEAR           |                       |                       |                       |                       | Agreement with...<br>1=Strongly disagree 2=Disagree<br>3=Neither agree nor disagree 4=Agree 5=Strongly agree                       | NOW                   |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |  | 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I value reading about topics outside of engineering (history, business, politics, the cultures of other parts of the world, etc.). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I enjoy thinking about how different fields approach the same problem in different ways.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Not all engineering problems have purely technical solutions.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | In solving engineering problems I often seek information from experts in other academic fields.                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Given knowledge and ideas from different fields, I can figure out what is appropriate for solving a problem.                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I see connections between ideas in engineering and ideas in the humanities and social sciences.                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I can take ideas from <u>outside engineering</u> and synthesize them in ways that help me better understand or explain a problem.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I can use what I have learned in one field in another setting or to solve a new problem.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**15 Recognizing Perspectives.** Indicate your level of agreement with the following (1) when you were a graduating senior (SENIOR YEAR) and (2) currently (NOW):

| SENIOR YEAR           |                       |                       |                       |                       | Agreement with...<br>1=Strongly disagree 2=Disagree<br>3=Neither agree nor disagree 4=Agree 5=Strongly agree   | NOW                   |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |  | 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I often step back and reflect on what I am thinking to determine whether I might be missing something.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I frequently stop to think about where I might be going wrong or right with a problem solution.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | If asked, I could identify the kinds of knowledge and ideas that are distinctive to different fields of study (chemistry, psychology, literature, etc.). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I recognize the kinds of evidence that different fields of study rely on.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I'm good at figuring out what experts in different fields have missed in explaining a problem or proposing a solution.                                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | I usually know when my own biases are getting in the way of my understanding of a problem or finding a solution.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

## UNDERGRADUATE PROGRAM EMPHASES

**16. Topics in Engineering.** Overall, (1) how much did the courses in your undergraduate engineering program emphasize each of the following and (2) how important are they in your work now?

| BACHELOR'S PROGRAM    |                       |                       |                       |                       | Emphasis on...<br>1=Little/none 2=Slight 3=Moderate 4=High 5=Very high                    | IMPORTANCE NOW        |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |   | 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Ethical issues in practice.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | The importance of life-long learning.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Examining my beliefs and values and how they affect my ethical decisions.                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | The value of gender, racial/ethnic, or cultural diversity.                                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Working with people who differ from me in gender, race/ethnicity, or cultural background. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Creativity and innovation.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Current workforce and economic trends (globalization, outsourcing, etc.).                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Emerging technologies.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | How theories are used in practice.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**17. Professional Skills.** Overall, (1) how much did the courses in your undergraduate engineering program emphasize each of the following and (2) how important are they in your work now?

| BACHELOR'S PROGRAM    |                       |                       |                       |                       | Emphasis on...<br>1=Little/none 2=Slight 3=Moderate 4=High 5=Very high                     | IMPORTANCE NOW        |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |  | 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Professional skills (knowing codes and standards, being on time, meeting deadlines, etc.). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Written and oral communication skills.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Leadership skills.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Working effectively in teams.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Working with multinational groups or teams.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Project management skills (budgeting, monitoring progress, managing people, etc.).         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**18. Problem Solving.** Overall, (1) how much did the courses in your undergraduate engineering program emphasize each of the following and (2) how important are they in your work now?

| BACHELOR'S PROGRAM    |                       |                       |                       |                       | Emphasis on...<br>1=Little/none 2=Slight 3=Moderate 4=High 5=Very high                                     | IMPORTANCE NOW        |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |  | 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Understanding how a solution can be shaped by environmental, cultural, economic, and other considerations. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <u>Understanding</u> how knowledge from several fields can help solve a problem.                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <u>Applying</u> knowledge from several fields to solve a problem.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Systems thinking.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Defining a problem.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Generating and evaluating ideas about how to solve an engineering problem.                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

### UNDERGRADUATE EXPERIENCES

**19. As an undergraduate student, approximately how many months did you spend participating in each of the following:**

|  | # of months          |                      |
|--|----------------------|----------------------|
| Undergraduate research activities  | <input type="text"/> | <input type="text"/> |
| Engineering internship(s)  | <input type="text"/> | <input type="text"/> |
| Engineering cooperative education experience(s)                                | <input type="text"/> | <input type="text"/> |
| Study abroad or an international school-related tour(s)                        | <input type="text"/> | <input type="text"/> |
| Working on humanitarian engineering projects (Engineers without Borders, etc.) | <input type="text"/> | <input type="text"/> |
| Non-engineering related community service or volunteer work                    | <input type="text"/> | <input type="text"/> |
| Student design project(s)/competition(s) beyond class requirements             | <input type="text"/> | <input type="text"/> |



20. As an undergraduate student, how active were you in the following activities:

|   | Not active            | Slightly active       | Moderately active     | Highly active         | Extremely active      |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| An engineering club or student chapter of a professional society (IEEE, ASME, ASCE, etc.)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other engineering-related clubs or programs for women and/or minority students (e.g., NSBE, SHPE, SWE, WISE, etc.)                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other clubs or activities (hobbies, civic or church organizations, campus publications, student government, Greek life, sports, etc.) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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

| During my undergraduate career:  | Strongly disagree     | Disagree              | Neither agree nor disagree | Agree                 | Strongly agree        |
|--|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| Some engineering students used offensive words, behaviors, or gestures directed at students because of their <u>gender</u> .         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Some engineering students used offensive words, behaviors, or gestures directed at students because of their <u>race/ethnicity</u> . | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| My <u>gender</u> influenced my choice of engineering field.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| My <u>race/ethnicity</u> influenced my choice of engineering field.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |

### CURRENT PROFESSIONAL SITUATION

22. What degree(s) do you hold? (Please check all that apply.)

|            | In Engineering        | Outside Engineering   |
|------------|-----------------------|-----------------------|
| Bachelor's | <input type="radio"/> | <input type="radio"/> |
| Master's   | <input type="radio"/> | <input type="radio"/> |
| Doctorate  | <input type="radio"/> | <input type="radio"/> |

**23. Are you currently enrolled in a graduate program?**

- No
- Yes →

**24. What degree are you seeking?**

- MA/MS/M Eng
- MBA
- JD
- MD/DDS
- PhD
- Other

**25. In what field will you earn your graduate degree?**

- Bio-medical/Bio-engineering
- Chemical engineering
- Civil engineering
- Electrical engineering
- General engineering/Engineering Science
- Industrial engineering
- Mechanical engineering
- Other engineering field
- Business
- Law
- Medicine
- Other field (not in engineering)

**26. What is your primary employment status?**

- Employed full-time
- Employed part-time
- Self-employed
- Employed as a graduate assistant
- Not currently employed

**27. Since completing my undergraduate degree, I have: (Please select all that apply.)**

- Taken credit-bearing courses from a college or university (in any format)
- Participated in required training through my employer
- Participated in voluntary training through my employer
- Taken courses offered by an organization other than my employer and not associated with a university or college
- None of the above

**Directions:** If you are presently employed, please complete the questions on this page. If you are not presently employed, please continue to Question 31 on the next page.

**28. Which one of the following best describes your (if self-employed) or your employer's primary business activity? [Categories of the North American Industry Classification System]**

- Accommodation or food services
- Administrative or support or waste management remediation services
- Agriculture, forestry, fishing or hunting
- Arts, entertainment, or recreation
- Construction
- Educational services
- Finance and insurance
- Health care or social assistance
- Information
- Management of companies or enterprises
- Manufacturing
- Mining (including oil and gas)
- Professional, scientific, or technical services
- Public administration (government, civil service, military)
- Real estate or rental leasing
- Retail trade
- Transportation or warehousing
- Utilities
- Wholesale trade
- Other (please specify): \_\_\_\_\_

**29. Which one of the following best describes your primary job function?**

- |  |   |
|--|---|
| <input type="radio"/> Business/finance                       | <input type="radio"/> Marketing/sales   |
| <input type="radio"/> Consultant                             | <input type="radio"/> Production, installation, delivery of services          |
| <input type="radio"/> Faculty/academic professional          | <input type="radio"/> Supervisor of professional/technical/research personnel |
| <input type="radio"/> Human resources                        | <input type="radio"/> Professional/technical/research personnel               |
| <input type="radio"/> Information/technology/network support | <input type="radio"/> Research/development/testing                            |
| <input type="radio"/> Management/administration/executive    | <input type="radio"/> Other (please specify): _____                           |

**30. How closely are your current job responsibilities related to your undergraduate engineering degree?**

- Directly related
- Somewhat related
- Not related

31. Please indicate whether you agree or disagree with each of the following statements.

|   | Strongly disagree     | Disagree              | Neither agree nor disagree | Agree                 | Strongly agree        |
|---|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| My gender has been a disadvantage in my engineering career.         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| My race/ethnicity has been a disadvantage in my engineering career. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |

32. Have you taken the Fundamentals of Engineering (FE) exam?

No

Yes, in (most recent year):     Did you pass?  Yes  No

33. Do you have, or are you working towards, your professional engineer's (PE) license?

Yes

No

**Thank you very much for your participation!**  
Please return the survey in the postage-paid envelope provided.