

# **IE Squared Codebook**

*Version 1.8 (5/23/2017)*

Contents	
<i>Construct Items by Year</i> .....	3
<i>Survey Questions for Students</i> .....	5
<i>Background, Academic, and Extracurricular Experiences</i> .....	6
<i>Interest</i> .....	8
<i>Engineering Identity</i> .....	9
<i>Self-Efficacy</i> .....	11
<i>Outcome Expectations in Engineering</i> .....	11
<i>Outcome Expectations in the Course</i> .....	12
<i>Implicit Person Theory</i> .....	13
<i>Diversity</i> .....	14
<i>Goals</i> .....	15
<i>Performance/Mastery Approach/Avoidance</i> .....	16
<i>Diversity/Inclusion Definitions</i> .....	17
<i>Diversity Values and Behaviors</i> .....	18
<i>Open Ended Items</i> .....	21
<i>Explicit Role Assignments: Jason, Julie, Jorge, Juanita</i> .....	22
<i>Neutral Role Assignments: Jason, Julie, Jorge, Juanita</i> .....	27
<i>Class Activity Questions</i> .....	31

## 2014

Construct	Full Scale	Short Scale	Reverse
Interest	INT1-INT8	INT3,4,5	
Engineering Identity	ID1-ID16	ID1,5,7,9	ID2,6,12
Self-Efficacy	SE1-SE5	SE2,3,4	
Outcome Expectations in Engineering	OEE1-OEE6	OEE4,5,6	
Outcome Expectations in the Course	OEC1-OEC8	OEC3,4,7	
Diversity	DIV1-DIV10	DIV2,4,5,7,8	DIV7,8,10
Goals	GOAL1-GOAL7	GOAL1,2,4,7	GOAL7
Performance/Mastery Approach/Avoidance	PAP1-PAP3, MAV1-MAV3 PAV1-PAV3, MAP1-MAP3	PAP1-PAP3, MAV1-MAV3 PAV1-PAV3, MAP1-MAP3	
Class Activities	ENGR_SE1-ENGR_SE12 CIVE_SE1-CIVE_SE16 CBE_SE1-CBE_SE11 MECH_SE1-MECH_SE13		
Open Ended	Q22, Q24, Q25, Q26, Q64, Q27, Q68, Q70, Q72, Q74, Q76		
Role scenarios		ODES,OMAN,OREC,OREP, SDES,SMAN,SREC,SREP	

*In 2014 full scales were administered at time points 1 and 5 and short scales at time points 2, 3, and 4. Role scenario items administered at time point 4 only. Class activities and open ended items administered at time point 5 only.*

## 2015

Construct	Full Scale	Short Scale	Reverse
Interest	INT1-INT8	INT3,4,5	
Engineering Identity	ID1-ID16	ID1,5,7,9	ID2,6,12
Self-Efficacy	SE1-SE5	SE2,3,4	
Outcome Expectations in Engineering	OEE1-OEE6	OEE4,5,6	
Outcome Expectations in the Course	OEC1-OEC8	OEC3,4,7	
Diversity	DIV1-DIV10	DIV2,4,5,7,8	DIV7,8,10
Goals	GOAL1-GOAL7	GOAL1,2,4,7	GOAL7
Performance/Mastery Approach/Avoidance	PAP1-PAP3, MAV1-MAV3 PAV1-PAV3, MAP1-MAP3	PAP1-PAP3, MAV1-MAV3 PAV1-PAV3, MAP1-MAP3	
Implicit Person Theory	MINF1-MINF7, MING1-MING3	MINF1-MINF4, MING1-MING3	MINF1-7
Class Activities	CIVE_SE1-CIVE_SE16 ENGR_SE1-ENGR_SE12 MECH_SE1-MECH_SE13		
Open Ended	Q22, Q24, Q25, Q26, Q64, Q27, Q68, Q70, Q72, Q74, Q76		
Role scenarios		ODES,OMAN,OREC,OREP, SDES,SMAN,SREC,SREP	

*In 2015 full scales were administered at times 1 and 5 and short scales at times 2, 3, and 4. Implicit Person Theory short scale was used in time point 5. Role scenario items administered at time point 4 only. Class activities were administered at time point 5 only (CBE excluded for inconsistencies) and open ended items administered at time points 1 and 5.*

## 2016

Construct	Short Scale		Reverse
Interest	INT3,4,5		
Engineering Identity	ID1,5,7,9		ID2,6,12
Self-Efficacy	SE2,3,4		
Outcome Expectations in Engineering	OEE4,5,6		
Outcome Expectations in the Course	OEC3,4,7		
Diversity	DIV2,4,5,7,8		DIV7,8,10
Goals	GOAL1,2,4,7		GOAL7
Performance/Mastery Approach/Avoidance	PAP1-PAP3, MAV1-MAV3 PAV1-PAV3, MAP1-MAP3		
Implicit Person Theory	MINF1-MINF4, MING1-MING3		MINF1-7
Defining Diversity	DFDV1-DFDV5 (Only at 1 and 5)		
Defining Inclusion	DFIC1-DFIC5 (Only at 1 and 5)		
	Time 1	Times 2-5	
Diversity Values	DVVL1- DVVL14	DVVL1,2,3,5,6,7,8,9,10,11,12, 14,15,16,17,18,19	
Diversity Behaviors	DVBH1- DVBH24	DVBH2,3,4,6,7,8,10,11,13,15, 16,17,19,20,21,22,23	DVBH5,14,24
Open Ended	OEND1-OEND4		
Role scenarios	ODES,OMAN,OREC,OREP, SDES,SMAN,SREC,SREP		

*In 2016 short scales were used at all time points. Role scenario items administered at time point 4 only. Open ended items were administered at time point 5 only.*

Q46 WHAT ELSE DO I NEED TO KNOW? Please review the items below to let the research team know which activities you consent to participate in.

**1 yes**

**2 no**

Researchers may collect copies of my coursework.

Researchers may gather information about my major and GPA in this and future semesters.

Q48 Clicking below acknowledges that you have read the information stated and willingly participate in this study. Clicking below also acknowledges that you have received a copy of this document containing 3 pages.

Q56 In addition to the survey, you are invited to participate in other aspects of this research study.

Please check “Yes” or “No” next to each research activity to let us know what activities you are volunteering to participate in or opt out of.

**1 yes**

**2 no**

56\_1 Researchers may take photos of me to share with our funders about the progress of our study.

56\_2 Researchers may contact me during the semester to ask for an interview.

56\_3 Researchers may gather my attendance information from my professor.

56\_4 Researchers may contact me again in the future to follow-up in this study or to participate in new research projects.

IDNUMBER Unique participant identifier

**1000's = 2014**

**2000's= 2015**

**3000's= 2016**

YEAR -Survey year

**2014 (14)**

**2015 (15)**

**2016 (16)**

TRT\_CON Control or treatment group identifier

**Treatment (1)**

**Control (0)**

## **Background, Academic Information**

EID\_1 Please list your eID. (usually a combination of letters, e.g., msmith)

( )

Q3\_1 What is your year in school?

**Freshman (1)**

**Sophomore (2)**

**Junior (3)**

**Senior (4)**

Q3\_1\_A Other (5) \_\_\_\_\_

Q4\_1 Please indicate your ethnic group.

**Hispanic or Latino (1)**

**Not Hispanic or Latino (2)**

**Prefer not to respond (3)**

Q5 Please indicate your race. Please select all that apply.

**Q5\_1 American Indian or Alaskan Native (1)**

**Q5\_2 Asian (2)**

**Q5\_3 Black or African American (3)**

**Q5\_4 Native Hawaiian or Other Pacific Islander (4)**

**Q5\_5 White (5)**

**Q5\_6 Prefer not to respond (6)**

Q6\_1 Please indicate your sex.

**Male (1)**

**Female (2)**

Q8\_1 Please identify your major.

**Chemical and Biological Engineering (1)**

**Civil Engineering (2)**

**Computer Engineering (3)**

**Engineering Science (4)**

**Environmental Engineering (5)**

**Electrical Engineering (6)**

**Mechanical Engineering (7)**

**Engineering Open Option (8)**

**Other (9)**

(Answer If Please identify your major, Other is selected.)

Q8\_1\_A Because you selected other, please identify your major.

( )

Q9\_1 Are you are part of the School of Biomedical Engineering?

**Yes (1)**

**No (2)**

**Don't know (3)**

Q10\_1 Have you taken this course before this semester?

**Yes (1)**

**No (2)**

COURSE In which first year engineering course are you enrolled? (#1-4)

**Introduction: Civil and Environmental Engineering (CIVE 102:Tuesday/Thursday 10-11) (1)**

**Chemical and Biological Engineering I (CBE 101: Tuesday/Thursday 9-10) (2)**

**Grand Challenges in Engineering (GRAND 101: Monday/Wednesday/Friday 11-12) (3)**

**Introduction to Mechanical Engineering (MECH 103: Monday/Wednesday/Friday 9-10) (4)**

COURSE\_NAME

**Introduction: Civil and Environmental Engineering (CIVE)**

**Chemical and Biological Engineering I (CBE)**

**Grand Challenges in Engineering (GRAND)**

**Introduction to Mechanical Engineering (MECH)**

*\*Survey Item Label Coding= SurveySectionAbbreviation\_Item#\_Survey#*

## Interest

(INT) Q11 Part I Instructions: Now, please indicate your degree of interest in doing each of the following activities. Use the 1-5 scale to show how much interest you have in each activity. How much interest do you have in:

**1 - Very Low Interest**

**2 - Low Interest**

**3 - Medium Interest**

**4 - High Interest**

**5 - Very High Interest**

INT 1\_ Solving practical math problems?

INT 2\_ Reading articles or books about engineering issues?

INT 3\_ Working on a project involving engineering principles?

INT 4\_ Solving complicated technical problems?

INT 5\_ Working on a project involving scientific concepts?

INT 6\_ Examining how machines work?

INT 7\_ Working in groups to solve engineering problems?

INT 8\_ Watching television shows about engineering (e.g. Mythbusters, Modern Marvels)?



# Engineering Identity

(ID) Q12 Part II Please select the best answer on the scale from 1 (strongly disagree) to 7 (strongly agree).

- 1 – Strongly Disagree
- 2 – Disagree
- 3 – Slightly Disagree
- 4 – Neutral
- 5 – Slightly Agree
- 6 – Agree
- 7 – Strongly Agree

ID 1\_ In general, being an engineer is an important part of my self-image.

ID 2\_ Being an engineer is unimportant to my sense of what kind of person I am. **(REVERSE)**

ID 3\_ I have a strong sense of belonging to the community of engineering.

ID 4\_ I derive great personal satisfaction from working on important engineering projects.

ID 5\_ Being an engineer is an important reflection of who I am.

ID 6\_ Being an engineer is NOT a major factor in my social relationships. **(REVERSE)**

(ID) Q13 Part II (continued) Please select the best answer on the scale from 1 (strongly disagree) to 7 (strongly agree).

- 1 – Strongly Disagree
- 2 – Disagree
- 3 – Slightly Disagree
- 4 – Neutral
- 5 – Slightly Agree
- 6 – Agree
- 7 – Strongly Agree

ID 7\_ I have come to think of myself as 'an engineer'.

ID 8\_ Thinking of myself as an engineer is compatible with other aspects of my background (ethnicity, gender, social class, etc.)

ID 9\_ I feel like I belong in the field of engineering.

ID 10\_ I am an engineer.

ID 11\_ My social network includes a lot of engineers and/or engineering students.

ID 12\_ I would feel more like an engineer if there were more people of my background (ethnicity, gender, social class, etc.) in my field. **(REVERSE)**

ID 13\_ The daily work of an engineer is appealing to me.

(ID) Q14 Part II (continued) Please select the best answer on the scale from 1 (strongly disagree) to 7 (strongly agree).

**1 – Strongly Disagree**

**2 – Disagree**

**3 – Slightly Disagree**

**4 – Neutral**

**5 – Slightly Agree**

**6 – Agree**

**7 – Strongly Agree**

ID 14\_ My classmates treat me like an engineer.

ID 15\_ My instructor treats me like an engineer.

ID 16\_ It is important that others see me as an engineer.

## Self-Efficacy

(SE) Q15 Part III Instructions: The following is a list of major steps along the way to completing an engineering degree. Please indicate how much confidence you have in your ability to complete each of these steps in relation to the engineering major that you are most likely to pursue. Use the 1-5 scale below to indicate your degree of confidence. How much confidence do you have in your ability to:

**1 – No Confidence**

**2 – Little Confidence**

**3 – Moderate Confidence**

**4 – Strong Confidence**

**5 – Complete Confidence**

SE 1\_ Complete your "basic science" (i.e., math, physics, chemistry) requirements for your engineering major with grades of B or better.

SE 2\_ Excel in your engineering major over this current semester.

SE 3\_ Excel in your engineering major over the next two semesters.

SE 4\_ Complete the upper level required courses in your engineering major with an overall grade point average of B or better.

SE 5\_ Complete a degree in engineering.

## OEE

(OEE) Q16 Part IV Instructions: Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements. The items on this page relate to getting a B.S. in engineering. Graduating with a BS degree in engineering will likely allow me to:

**1 – Strongly Disagree**

**2 – Disagree**

**3 – Slightly Disagree**

**4 – Unsure**

**5 – Slightly Agree**

**6 – Agree**

**7 – Strongly Agree**

OEE 1\_ receive a good job offer.

OEE 2\_ earn an attractive salary.

OEE 3\_ get respect from other people.

OEE 4\_ do work that I would find satisfying.

OEE 5\_ do exciting work.

OEE 6\_ work in a field where I feel like I belong.

## OEC

(OEC) Q17 Part V Instructions: Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements. The items on this page relate to your current engineering course.

- 1 – Strongly Disagree**
- 2 – Disagree**
- 3 – Slightly Disagree**
- 4 – Unsure**
- 5 – Slightly Agree**
- 6 – Agree**
- 7 – Strongly Agree**

OEC 1\_ If I work harder in this engineering class, I will earn better grades.

OEC 2\_ If I work harder in this engineering class, I will do better in future engineering classes.

OEC 3\_ If I participate in this engineering class, I will earn a better grade.

OEC 4\_ If I participate in this engineering class, I will understand the material better.

(OEC) Q28 Part V (continued) Instructions: Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements. The items on this page relate to your current engineering course.

- 1 – Strongly Disagree**
- 2 – Disagree**
- 3 – Slightly Disagree**
- 4 – Unsure**
- 5 – Slightly Agree**
- 6 – Agree**
- 7 – Strongly Agree**

OEC 5\_ If I study for this engineering class with classmates, I will earn a better grade.

OEC 6\_ If I study for this engineering class with classmates, I will understand the material better.

OEC 7\_ If I attend this engineering class, I will do better on assignments.

OEC 8\_ If I complete my homework assignments in this engineering class, I will do better on the tests.

# Implicit Person Theory

(MINF) (MING) Q18 Part VI Instructions: Please respond to each of the following statements using the response scale.

- 1 – Strongly Disagree**
- 2 – Disagree Somewhat**
- 3 – Slightly Disagree**
- 4 – Slightly Agree**
- 5 – Agree Somewhat**
- 6 – Strongly Agree**

MINF 1\_ The kind of person someone is says something basic about them, and it can't be changed very much. **(REVERSE)**

MINF 2\_ People can do things differently, but the important parts of who they are can't really be changed. **(REVERSE)**

MING 1\_ No matter who you are, you can significantly change your intelligence level.

MINF 3\_ Everyone is a certain kind of person, and there is not much that they can do to really change that. **(REVERSE)**

MINF 4\_ People are either math people or not- you can't really change that. **(REVERSE)**

MINF 5\_ You can learn new things, but you can't really change your basic intelligence. **(REVERSE)**

(MINF) (MING) Q40 Part VI (continued) Instructions: Please respond to each of the following statements using the response scale.

- 1 – Strongly Disagree**
- 2 – Disagree Somewhat**
- 3 – Slightly Disagree**
- 4 – Slightly Agree**
- 5 – Agree Somewhat**
- 6 – Strongly Agree**

MING 2\_ No matter how much intelligence you have, you can always change it quite a bit.

MING 3\_ You can even change your skill level in mathematics considerably.

MINF 6\_ Your innate math skills are something about you that you can't change very much. **(REVERSE)**

MINF 7\_ As much as I hate to admit it, you can't teach an old dog new tricks. People really can't change their deepest attributes. **(REVERSE)**

# Diversity

(DIV) Q37 Part VII Instructions: Now please rate your agreement with each of the following statements using the scale provided.

- 1 – Strongly Disagree**
- 2 – Disagree**
- 3 – Slightly Disagree**
- 4 – Unsure**
- 5 – Slightly Agree**
- 6 – Agree**
- 7 – Strongly Agree**

DIV 1\_ Diverse viewpoints bring creativity and energy to a work group.

DIV 2\_ Working with teams of people from diverse backgrounds is stimulating.

DIV 3\_ People are motivated and productive when they feel accepted for who they are.

DIV 4\_ Diversity improves the work of organizations.

DIV 5\_ Diversity brings many perspectives to problem-solving.

DIV 6\_ I am comfortable interacting with people from a different racial or ethnic background.

DIV 7\_ I prefer to work in engineering teams with people who are like me. **(REVERSE)**

(DIV) Q19 Part VII (continued) Instructions: Now please rate your agreement with each of the following statements using the scale provided.

- 1 – Strongly Disagree**
- 2 – Disagree**
- 3 – Slightly Disagree**
- 4 – Unsure**
- 5 – Slightly Agree**
- 6 – Agree**
- 7 – Strongly Agree**

DIV 8\_ I prefer working on engineering projects with people of the same sex. **(REVERSE)**

DIV 9\_ I prefer working on engineering projects with people of the opposite sex.

DIV 10\_ It takes a certain type of personality to be a successful engineer. **(REVERSE)**

## GOALS

(GOAL) Q20 Part VIII Instructions: Using the scale below, indicate your level of agreement with each of the following statements.

**1 – Strongly Disagree**

**2 – Disagree**

**3 – Slightly Disagree**

**4 – Unsure**

**5 – Slightly Agree**

**6 – Agree**

**7 – Strongly Agree**

GOAL 1\_ I intend to major in an engineering field.

GOAL 2\_ I plan to remain enrolled in an engineering major over the next semester.

GOAL 3\_ I think that earning a bachelors degree in engineering is a realistic goal for me.

GOAL 4\_ I am fully committed to getting my college degree in engineering.

GOAL 5\_ I plan to look for summer internships in engineering.

GOAL 6\_ I plan to look for undergraduate research opportunities with engineering professors.

GOAL 7\_ I am considering switching to another major. **(REVERSE)**

## Performance/Mastery Approach/Avoidance

*(Prior to using these items, please check that the items align with the original subscales. It appears some items may be miscoded.)*

Q21 Part IX Instructions: Using the scale below, indicate your level of agreement with each of the following statements.

PAP 1\_ It is important for me to do better than other students.

PAP 2\_ My goal in this class is to avoid performing poorly.

MAV 1\_ I desire to completely master the material presented in this class.

MAV 2\_ Sometimes I'm afraid that I may not understand the content of this class as thoroughly as I'd like.

Q29 Part IX (continued) Instructions: Using the scale below, indicate your level of agreement with each of the following statements.

MAV 3\_ I am often concerned that I may not learn all that there is to learn in this class.

PAP 3\_ My goal in this class is to get a better grade than most of the other students.

MAP 1\_ My fear of performing poorly in this class is what motivates me.

MAP 2\_ It is important for me to understand the content of this course as thoroughly as possible.

Q30 Part IX (continued) Instructions: Using the scale below, indicate your level of agreement with each of the following statements.

MAP 3\_ I worry that I may not learn all that I possibly could in this class.

PAV 1\_ I want to avoid doing poorly in this class.

PAV 2\_ It is important for me to do well compared to others in this class.

PAV 3\_ I want to learn as much as possible from this class.



## DFDV

Q37 Part X Instructions: Please indicate how strongly each of the following definitions of diversity align with YOUR personal definition of diversity. To me, diversity is defined as the different:

**1-Strongly Disagree**

**2-Disagree**

**3-Slightly Disagree**

**4-Unsure**

**5-Slightly Agree**

**6-Agree**

**7-Strongly Agree**

DFDV1\_Ways that people think about the world, for example, how people learn, interpret problems, and create solutions.

DFDV2\_Demographic identities that people have, for example race, gender, sexual orientation, socioeconomic status, country of origin, and language.

DFDV3\_Interests that people have, for example what people do for recreation and hobbies, such as reading, traveling, or playing video games.

DFDV4\_Life experiences that people bring to a situation, for example growing up on a farm or living in different countries.

DFDV5\_Individual and group identities that significantly impact their experiences due to social, historical, and/or cultural context.

## DFIC

Q39 Part XI Instructions: Please indicate how strongly each of the following definitions of inclusion align with YOUR personal definition of inclusion. To me, inclusion:

**1-Strongly Disagree**

**2-Disagree**

**3-Slightly Disagree**

**4-Unsure**

**5-Slightly Agree**

**6-Agree**

**7-Strongly Agree**

DFIC1\_Is just a different word for diversity.

DFIC2\_Means making sure a lot of diverse people are encouraged to participate and are valued in decision making.

DFIC3\_Means creating space for everybody to participate toward a common goal, no matter what skills or backgrounds they have.

DFIC4\_Means including everyone even if their skills are not directly relevant to the task.

DFIC5\_Means diversity in identities and experiences among people are collectively affirmed, welcomed, and respected.

## DVVL

Q41 Part XII Instructions: Please indicate how strongly you feel about the following statement. Engineers should value diversity in order to:

**1-Strongly Disagree**

**2-Disagree**

**3-Slightly Disagree**

**4-Unsure**

**5-Slightly Agree**

**6-Agree**

**7-Strongly Agree**

DVVL1\_Be sensitive to changes in U.S. demographics.

DVVL2\_Better serve a diverse population.

DVVL3\_Help them understand client and customer needs.

DVVL4\_Help bring new people to the profession.

DVVL5\_Improve products.

DVVL6\_Be fair.

DVVL15\_Increase public access to technology and engineered products

DVVL16\_Improve communication with the public

DVVL17\_Identify possible stakeholders in an engineering project

DVVL18\_Gain public trust

Q43 Part XII (continued) Instructions: Please indicate how strongly you feel about the following statement. Engineers should value diversity in order to:

**1-Strongly Disagree**

**2-Disagree**

**3-Slightly Disagree**

**4-Unsure**

**5-Slightly Agree**

**6-Agree**

**7-Strongly Agree**

DVVL7\_Promote positive attitudes.

DVVL8\_Promote a healthy work environment.

DVVL9\_Fulfill a social responsibility for making the world better.

DVVL10\_Work for a greater cause.

DVVL11\_Help improve the bottom line.

DVVL12\_Contribute to good business sense.

DVVL13\_Foster creativity.

DVVL14\_Do the right thing.

DVVL19\_Collaborate effectively with stakeholders in an engineering project

## DVBH

Q45 Part XIII Instructions: Please indicate how likely you are to do the following behaviors when working on a team. If you haven't encountered one of these situations, please take your best guess as to how you would respond. While working on a team, I:

- 1-Very Unlikely**
- 2-Unlikely**
- 3-Slightly Unlikely**
- 4-Unsure**
- 5-Slightly Likely**
- 6-Likely**
- 7-Very Likely**

DVBH1\_ Focus on the task rather than on the interactions with people.

DVBH2\_ Challenge homophobic behaviors.

DVBH3\_ Make sure every team member has the opportunity to contribute to the project.

DVBH4\_ Want to have lots of skills represented on my team.

DVBH5\_ Try to ignore potential discrimination so I do not make anyone uncomfortable. **(REVERSE)**

DVBH6\_ Recognize the need for a wide variety of skills and backgrounds to address complex problems.

DVBH7\_ Include everyone in all team meetings.

DVBH8\_ Thank team members who are good team players.

Q47 Part XIII (continued) Instructions: Please indicate how likely you are to do the following behaviors when working on a team. If you haven't encountered one of these situations, please take your best guess as to how you would respond. While working on a team, I:

- 1-Very Unlikely**
- 2-Unlikely**
- 3-Slightly Unlikely**
- 4-Unsure**
- 5-Slightly Likely**
- 6-Likely**
- 7-Very Likely**

DVBH9\_ Let team members choose roles according to their varied strengths and backgrounds.

DVBH10\_ Challenge racist behaviors.

DVBH11\_ Challenge any type of discriminatory behaviors.

DVBH12\_ Direct team members to do specific tasks.

DVBH13\_ Challenge sexist behaviors.

DVBH14\_ Try to get a lot of people on my team who are like me. **(REVERSE)**

DVBH15\_ Make sure to give credit to team members who make contributions to the project.

Q49 Part XIII (continued) Instructions: Please indicate how likely you are to do the following behaviors when working on a team. If you haven't encountered one of these situations, please take your best guess as to how you would respond. While working on a team, I:

**1-Very Unlikely**

**2-Unlikely**

**3-Slightly Unlikely**

**4-Unsure**

**5-Slightly Likely**

**6-Likely**

**7-Very Likely**

DVBH16\_ Actively work to overcome stereotypes I have about other people.

DVBH17\_ Recognize that everyone holds implicit biases.

DVBH18\_ Strive to have lots of unique backgrounds on my team.

DVBH19\_ Make sure all team members have the opportunity to take part in decision-making.

DVBH20\_ Challenge xenophobic behaviors, which are behaviors that discriminate against people from other countries.

DVBH21\_ Make sure every team member feels comfortable sharing opinions.

DVBH22\_ Look for ways to prevent implicit biases from affecting decision-making.

DVBH23\_ Encourage every team member to share their perspective.

DVBH24\_ Push myself to be the team leader. **(REVERSE)**

## Open Ended Questions

OEND1\_ What do you remember learning from the interactive theater troupe?

OEND2\_ How will you use what you learned from the interactive theater troupe to be a better engineer?

OEND3\_ What do you remember learning about implicit bias?

OEND4\_ How will you use what you learned from the implicit bias assignment to be a better engineer?

Q22 Part X Please describe what you know about engineers. First, describe what an engineer does. Please write your answer in complete sentences in the box below.

Q24 Now, describe the characteristics of an engineer, such as their personality or skills. Please write your answer in complete sentences in the box below.

Q25 Part X (continued) Please let us know how you define diversity and how it is related to engineering. What is diversity? Please write your answer in complete sentences in the box below.

Q26 How is diversity related to engineering? Please write your answer in complete sentences in the box below.

Q64 What activities during the semester helped you learn about diversity? Please write your answer in complete sentences in the box below.

Q27 Part X (continued) Please respond to the question below. Do you see yourself as an engineer? Why or why not? Please write your answer in complete sentences in the box below.

Q68 What activities during the semester helped you see yourself as an engineer? Please write your answer in complete sentences in the box below.

Q70 Part XII Instructions: Using the scale below, rate your perception of the engineering profession.

\_\_\_\_\_ The engineering profession is (1)

Q72 Why did you rate the previous question this way?

Q74 Part XII (continued) Instructions: Using the scale below, rate your perception of the topic of your group project.

\_\_\_\_\_ Our group project was (1)

Q76 Why did you rate your group project this way?

Neutral\_Ins (whether the student received neutral or explicit instructions for the following scenarios)

**(1)** Neutral

**(0)** Explicit

ROLEID (which ID instructions the student was randomly given- each student received only 1)

**(1)** Jason

**(2)** Julie

**(3)** Jorge

**(4)** Juana

## Explicit

ROLEID **(1)** Q1 Part IX Instructions: Your engineering class is about to begin a new group project. You have been asked to recommend Jason for a role on a team for this engineering class project. Here is some background information on Jason and description of the team roles: Jason is a first year student at CSU majoring in engineering- open option. He is a White student from Colorado Springs. Jason's father has a technical certificate from a local two year college. Jason lives in the dorms at CSU, graduated high school with a 3.8 grade point average (GPA), and said that math was his favorite subject in high school.

The project manager will take the lead on overseeing the whole project: taking the lead on generating ideas, assigning tasks to group members when needed, making sure tasks are completed and that the work of different team members fits together properly at the end.

The data recorder will be responsible for keeping meticulous records of the data generated in the project and for sending out email reminders to the group members about meeting times.

The professional communications manager will take the lead on preparing the group's final report and presenting the final presentation to the class.

The design engineer will be responsible for the technical calculations needed for the design and creating the summary tables for the final report.

Q2 Based on the information above, how likely would YOU be to recommend Jason for the role of:

**1 – Very Unlikely**

**2 – Unlikely**

**3 – Somewhat Unlikely**

**4 – Undecided**

**5 – Somewhat Likely**

**6 – Likely**

**7 – Very Likely**

SMAN\_ Project Manager

SREC\_ Data Recorder

SREP\_ Technical Communications Leader

SDES\_ Design Engineer

Q3 How likely do you think MOST OTHER students in your Engineering Class be to recommend Jason for the role of:

**1 – Very Unlikely**

**2 – Unlikely**

**3 – Somewhat Unlikely**

**4 – Undecided**

**5 – Somewhat Likely**

**6 – Likely**

**7 – Very Likely**

OMAN\_ Project Manager

OREC\_ Data Recorder

OREP\_ Technical Communications Leader

ODES\_ Design Engineer

**ROLEID (2)** Q22 Part IX Instructions: Your engineering class is about to begin a new group project. You have been asked to recommend Julie for a role on a team for this engineering class project. Here is some background information on Julie and description of the team roles: Julie is a first year student at CSU majoring in engineering- open option. She is a White student from Colorado Springs. Julie's father has a technical certificate from a local two year college. Julie lives in the dorms at CSU, graduated high school with a 3.8 grade point average (GPA), and said that math was her favorite subject in high school. The project manager will take the lead on overseeing the whole project: taking the lead on generating ideas, assigning tasks to group members when needed, making sure tasks are completed and that the work of different team members fits together properly at the end.

The data recorder will be responsible for keeping meticulous records of the data generated in the project and for sending out email reminders to the group members about meeting times.

The professional communications manager will take the lead on preparing the group's final report and presenting the final presentation to the class.

The design engineer will be responsible for the technical calculations needed for the design and creating the summary tables for the final report.

Q23 How likely do you think MOST OTHER students in your Engineering Class be to recommend Julie for the role of:

**1 – Very Unlikely**

**2 – Unlikely**

**3 – Somewhat Unlikely**

**4 – Undecided**

**5 – Somewhat Likely**

**6 – Likely**

**7 – Very Likely**

OMAN\_ Project Manager

OREC\_ Data Recorder

OREP\_ Technical Communications Leader

ODES\_ Design Engineer

Q24 Based on the information above, how likely would YOU be to recommend Julie for the role of:

**1 – Very Unlikely**

**2 – Unlikely**

**3 – Somewhat Unlikely**

**4 – Undecided**

**5 – Somewhat Likely**

**6 – Likely**

**7 – Very Likely**

SMAN\_ Project Manager

SREC\_ Data Recorder

SREP\_ Technical Communications Leader

SDES\_ Design Engineer



**ROLEID (3)** Q25 Part IX Instructions: Your engineering class is about to begin a new group project. You have been asked to recommend Jorge for a role on a team for this engineering class project. Here is some background information on Jorge and description of the team roles: Jorge is a first year student at CSU majoring in engineering- open option. He is a Hispanic/Latino student from Colorado Springs. Jorge's father has a technical certificate from a local two year college. Jorge lives in the dorms at CSU, graduated high school with a 3.8 grade point average (GPA), and said that math was his favorite subject in high school.

The project manager will take the lead on overseeing the whole project: taking the lead on generating ideas, assigning tasks to group members when needed, making sure tasks are completed and that the work of different team members fits together properly at the end.

The data recorder will be responsible for keeping meticulous records of the data generated in the project and for sending out email reminders to the group members about meeting times.

The professional communications manager will take the lead on preparing the group's final report and presenting the final presentation to the class.

The design engineer will be responsible for the technical calculations needed for the design and creating the summary tables for the final report.

Q26 Based on the information above, how likely would YOU be to recommend Jorge for the role of:

**1 – Very Unlikely**

**2 – Unlikely**

**3 – Somewhat Unlikely**

**4 – Undecided**

**5 – Somewhat Likely**

**6 – Likely**

**7 – Very Likely**

SMAN\_ Project Manager

SREC\_ Data Recorder

SREP\_ Technical Communications Leader

SDES\_ Design Engineer

Q27 How likely do you think MOST OTHER students in your Engineering Class be to recommend Jorge for the role of:

**1 – Very Unlikely**

**2 – Unlikely**

**3 – Somewhat Unlikely**

**4 – Undecided**

**5 – Somewhat Likely**

**6 – Likely**

**7 – Very Likely**

OMAN\_ Project Manager

OREC\_ Data Recorder

OREP\_ Technical Communications Leader

ODES\_ Design Engineer

**ROLEID (4)** Q28 Part IX Instructions: Your engineering class is about to begin a new group project. You have been asked to recommend Juana for a role on a team for this engineering class project. Here is some background information on Juana and description of the team roles: Juana is a first year student at CSU majoring in engineering- open option. She is a Hispanic/Latino student from Colorado Springs. Juana's father has a technical certificate from a local two year college. Juana lives in the dorms at CSU, graduated high school with a 3.8 grade point average (GPA), and said that math was her favorite subject in high school.

The project manager will take the lead on overseeing the whole project: taking the lead on generating ideas, assigning tasks to group members when needed, making sure tasks are completed and that the work of different team members fits together properly at the end.

The data recorder will be responsible for keeping meticulous records of the data generated in the project and for sending out email reminders to the group members about meeting times.

The professional communications manager will take the lead on preparing the group's final report and presenting the final presentation to the class.

The design engineer will be responsible for the technical calculations needed for the design and creating the summary tables for the final report.

Q29 Based on the information above, how likely would YOU be to recommend Juana for the role of:

- 1 – Very Unlikely**
- 2 – Unlikely**
- 3 – Somewhat Unlikely**
- 4 – Undecided**
- 5 – Somewhat Likely**
- 6 – Likely**
- 7 – Very Likely**

SMAN\_ Project Manager

SREC\_ Data Recorder

SREP\_ Technical Communications Leader

SDES\_ Design Engineer

Q30 How likely do you think MOST OTHER students in your Engineering Class be to recommend Juana for the role of:

- 1 – Very Unlikely**
- 2 – Unlikely**
- 3 – Somewhat Unlikely**
- 4 – Undecided**
- 5 – Somewhat Likely**
- 6 – Likely**
- 7 – Very Likely**

OMAN\_ Project Manager

OREC\_ Data Recorder

OREP\_ Technical Communications Leader

ODES\_ Design Engineer

## Neutral

**ROLEID (1) Q1 Part IX** Instructions: Your engineering class is about to begin a new group project. You have been asked to recommend Jason for a role on a team for this engineering class project. Here is some background information on Jason and description of the team roles: Jason is a first year student at CSU majoring in engineering- open option. He is a student from Colorado Springs. Jason's father has a technical certificate from a local two year college. Jason lives in the dorms at CSU, graduated high school with a 3.8 grade point average (GPA), and said that math was his favorite subject in high school.

The project manager will take the lead on overseeing the whole project: taking the lead on generating ideas, assigning tasks to group members when needed, making sure tasks are completed and that the work of different team members fits together properly at the end.

The data recorder will be responsible for keeping meticulous records of the data generated in the project and for sending out email reminders to the group members about meeting times.

The professional communications manager will take the lead on preparing the group's final report and presenting the final presentation to the class.

The design engineer will be responsible for the technical calculations needed for the design and creating the summary tables for the final report.

**Q2** Based on the information above, how likely would YOU be to recommend Jason for the role of:

- 1 – Very Unlikely**
- 2 – Unlikely**
- 3 – Somewhat Unlikely**
- 4 – Undecided**
- 5 – Somewhat Likely**
- 6 – Likely**
- 7 – Very Likely**

SMAN\_ Project Manager

SREC\_ Data Recorder

SREP\_ Technical Communications Leader

SDES\_ Design Engineer

**Q3** How likely do you think MOST OTHER students in your Engineering Class be to recommend Jason for the role of:

- 1 – Very Unlikely**
- 2 – Unlikely**
- 3 – Somewhat Unlikely**
- 4 – Undecided**
- 5 – Somewhat Likely**
- 6 – Likely**
- 7 – Very Likely**

OMAN\_ Project Manager

OREC\_ Data Recorder

OREP\_ Technical Communications Leader

ODES\_ Design Engineer

**ROLEID (2)** Q22 Part IX Instructions: Your engineering class is about to begin a new group project. You have been asked to recommend Julie for a role on a team for this engineering class project. Here is some background information on Julie and description of the team roles: Julie is a first year student at CSU majoring in engineering- open option. She is a student from Colorado Springs. Julie's father has a technical certificate from a local two year college. Julie lives in the dorms at CSU, graduated high school with a 3.8 grade point average (GPA), and said that math was her favorite subject in high school.

The project manager will take the lead on overseeing the whole project: taking the lead on generating ideas, assigning tasks to group members when needed, making sure tasks are completed and that the work of different team members fits together properly at the end.

The data recorder will be responsible for keeping meticulous records of the data generated in the project and for sending out email reminders to the group members about meeting times.

The professional communications manager will take the lead on preparing the group's final report and presenting the final presentation to the class.

The design engineer will be responsible for the technical calculations needed for the design and creating the summary tables for the final report.

Q23 How likely do you think MOST OTHER students in your Engineering Class be to recommend Julie for the role of:

- 1 – Very Unlikely**
- 2 – Unlikely**
- 3 – Somewhat Unlikely**
- 4 – Undecided**
- 5 – Somewhat Likely**
- 6 – Likely**
- 7 – Very Likely**

OMAN\_ Project Manager

OREC\_ Data Recorder

OREP\_ Technical Communications Leader

ODES\_ Design Engineer

Q24 Based on the information above, how likely would YOU be to recommend Julie for the role of:

- 1 – Very Unlikely**
- 2 – Unlikely**
- 3 – Somewhat Unlikely**
- 4 – Undecided**
- 5 – Somewhat Likely**
- 6 – Likely**
- 7 – Very Likely**

SMAN\_ Project Manager

SREC\_ Data Recorder

SREP\_ Technical Communications Leader

SDES\_ Design Engineer

**ROLEID (3)** Q25 Part IX Instructions: Your engineering class is about to begin a new group project. You have been asked to recommend Jorge for a role on a team for this engineering class project. Here is some background information on Jorge and description of the team roles: Jorge is a first year student at CSU majoring in engineering- open option. He is a student from Colorado Springs. Jorge's father has a technical certificate from a local two year college. Jorge lives in the dorms at CSU, graduated high school with a 3.8 grade point average (GPA), and said that math was his favorite subject in high school.

The project manager will take the lead on overseeing the whole project: taking the lead on generating ideas, assigning tasks to group members when needed, making sure tasks are completed and that the work of different team members fits together properly at the end.

The data recorder will be responsible for keeping meticulous records of the data generated in the project and for sending out email reminders to the group members about meeting times.

The professional communications manager will take the lead on preparing the group's final report and presenting the final presentation to the class.

The design engineer will be responsible for the technical calculations needed for the design and creating the summary tables for the final report.

Q26 Based on the information above, how likely would YOU be to recommend Jorge for the role of:

- 1 – Very Unlikely**
- 2 – Unlikely**
- 3 – Somewhat Unlikely**
- 4 – Undecided**
- 5 – Somewhat Likely**
- 6 – Likely**
- 7 – Very Likely**

SMAN\_ Project Manager

SREC\_ Data Recorder

SREP\_ Technical Communications Leader

SDES\_ Design Engineer

Q27 How likely do you think MOST OTHER students in your Engineering Class be to recommend Jorge for the role of:

- 1 – Very Unlikely**
- 2 – Unlikely**
- 3 – Somewhat Unlikely**
- 4 – Undecided**
- 5 – Somewhat Likely**
- 6 – Likely**
- 7 – Very Likely**

OMAN\_ Project Manager

OREC\_ Data Recorder

OREP\_ Technical Communications Leader

ODES\_ Design Engineer

**ROLEID (4)** Q28 Part IX Instructions: Your engineering class is about to begin a new group project. You have been asked to recommend Juana for a role on a team for this engineering class project. Here is some background information on Juana and description of the team roles: Juana is a first year student at CSU majoring in engineering- open option. She is a student from Colorado Springs. Juana's father has a technical certificate from a local two year college. Juana lives in the dorms at CSU, graduated high school with a 3.8 grade point average (GPA), and said that math was her favorite subject in high school.

The project manager will take the lead on overseeing the whole project: taking the lead on generating ideas, assigning tasks to group members when needed, making sure tasks are completed and that the work of different team members fits together properly at the end.

The data recorder will be responsible for keeping meticulous records of the data generated in the project and for sending out email reminders to the group members about meeting times.

The professional communications manager will take the lead on preparing the group's final report and presenting the final presentation to the class.

The design engineer will be responsible for the technical calculations needed for the design and creating the summary tables for the final report.

Q29 Based on the information above, how likely would YOU be to recommend Juana for the role of:

- 1 – Very Unlikely**
- 2 – Unlikely**
- 3 – Somewhat Unlikely**
- 4 – Undecided**
- 5 – Somewhat Likely**
- 6 – Likely**
- 7 – Very Likely**

SMAN\_ Project Manager

SREC\_ Data Recorder

SREP\_ Technical Communications Leader

SDES\_ Design Engineer

Q30 How likely do you think MOST OTHER students in your Engineering Class be to recommend Juana for the role of:

- 1 – Very Unlikely**
- 2 – Unlikely**
- 3 – Somewhat Unlikely**
- 4 – Undecided**
- 5 – Somewhat Likely**
- 6 – Likely**
- 7 – Very Likely**

OMAN\_ Project Manager

OREC\_ Data Recorder

OREP\_ Technical Communications Leader

ODES\_ Design Engineer

## Class Activities

Answer If In which first year engineering course are you enrolled? Grand Challenges in Engineering (ENGR 101: Monday/Wednesday/Friday 11-12) Is Selected

Q36 Part X (continued) We are considering changing some of the activities in ENGR 101 and would like your input before making changes. We have listed all of the activities in this course and would like for you to respond to two sets of questions about the activities. First, for each activity below, please indicate how this course activity affected your level of confidence in your ability to become an engineer. If you did not participate or do not remember the activity, please mark "Not Applicable".

**1 – Definitely Decreased**

**2 – Decreased**

**3 – Slightly Decreased**

**4 – Did Not Impact**

**5 – Slightly Increased**

**6 – Increased**

**7 – Definitely Increased**

**8 – Not Applicable**

ENGR\_SE1 Discuss NAE grand challenges in general

ENGR\_SE 2 Discuss roles of engineers in defining challenges

ENGR\_SE 3 Matlab programming

ENGR\_SE 4 Cameroon EWB Group Projects

ENGR\_SE 5 Water Grand Challenge

ENGR\_SE 6 Discuss the engineering design process

ENGR\_SE 7 Visits by student organizations

ENGR\_SE 8 Nuclear Energy Grand Challenge

ENGR\_SE 9 Peer Assessment Tool for Grand Challenges

ENGR\_SE 10 Environment Grand Challenge

ENGR\_SE 11 Visit by Terry Comerford (College of Engineering Career Advisor)

ENGR\_SE 12 Interactive Theater Sketch with Troupe of Actors about Teamwork

Answer If In which first year engineering course are you enrolled? Introduction: Civil and Environmental Engineering (CIVE 102:Tuesday/Thursday 10-11) Is Selected

Q38 Part X (continued) We are considering changing some of the activities in CIVE 102 and would like your input before making changes. We have listed all of the activities in this course and would like for you to respond to two sets of questions about the activities. First, for each activity below, please indicate how this course activity affected your level of confidence in your ability to become an engineer. If you did not participate or do not remember the activity, please mark "Not Applicable".

**1 – Definitely Decreased**

**2 – Decreased**

**3 – Slightly Decreased**

**4 – Did Not Impact**

**5 – Slightly Increased**

**6 – Increased**

**7 – Definitely Increased**

**8 – Not Applicable**

CIVE\_SE 1 Lecture about what civil engineers do

CIVE\_SE 2 Lecture about what environmental engineers do

CIVE\_SE 3 Hurricane Katrina Video

CIVE\_SE 4 Learn about surveying

CIVE\_SE 5 Learn about Microsoft Excel

CIVE\_SE 6 Learn about engineering communication

CIVE\_SE 7 Learn about hydrology/hydraulic design

CIVE\_SE 8 Learn about urban drainage

CIVE\_SE 9 Learn about water quality and water treatment processes

CIVE\_SE 10 Visit from Dr. McLean (Dean of College of Engineering)

CIVE\_SE 11 Visit from Terry Comerford (College of Engineering Career Advisor)

CIVE\_SE 12 Visit from Dr. Troxell (mayor of Fort Collins)

CIVE\_SE 13 Visit from student organizations

CIVE\_SE 14 Presentations from Professional Engineers

CIVE\_SE 15 Interactions with Professors

CIVE\_SE 16 Interactions with TAs



Answer If In which first year engineering course are you enrolled? Chemical and Biological Engineering I (CBE 101: Tuesday/Thursday 9-10) Is Selected

Q40 Part X (continued) We are considering changing some of the activities in CBE 101 and would like your input before making changes. We have listed all of the activities in this course and would like for you to respond to two sets of questions about the activities. First, for each activity below, please indicate how this course activity affected your level of confidence in your ability to become an engineer. If you did not participate or do not remember the activity, please mark "Not Applicable".

**1 – Definitely Decreased**

**2 – Decreased**

**3 – Slightly Decreased**

**4 – Did Not Impact**

**5 – Slightly Increased**

**6 – Increased**

**7 – Definitely Increased**

**8 – Not Applicable**

CBE\_SE 1 Problem Solving: Molecular basis for mass transport

CBE\_SE 2 Calorimetry Lab

CBE\_SE 3 Problem Solving: Heat exchanger design

CBE\_SE 4 Conduction Lab

CBE\_SE 5 Problem Solving: Siphons

CBE\_SE 6 Siphon Lab

CBE\_SE 7 Problem Solving: Design

CBE\_SE 8 Engineering ethics

CBE\_SE 9 Interactions with Professors

CBE\_SE 10 Interactions with teaching assistant

CBE\_SE 11 Interactions with lab manager

Answer If In which first year engineering course are you enrolled? Introduction to Mechanical Engineering (MECH 103: Monday/Wednesday/Friday 9-10) Is Selected

Q42 Part X (continued) We are considering changing some of the activities in MECH 103 and would like your input before making changes. We have listed all of the activities in this course and would like for you to respond to two sets of questions about the activities. First, for each activity below, please indicate how this course activity affected your level of confidence in your ability to become an engineer. If you did not participate or do not remember the activity, please mark "Not Applicable".

- 1 – Definitely Decreased**
- 2 – Decreased**
- 3 – Slightly Decreased**
- 4 – Did Not Impact**
- 5 – Slightly Increased**
- 6 – Increased**
- 7 – Definitely Increased**
- 8 – Not Applicable**

MECH\_SE 1 Guest Lecture from Dr. Susan James (ME department head)

MECH\_SE 2 Guest Lecture from Dr. Fitzhorn and ME advisors

MECH\_SE 3 Guest Lecture from Dr. Ben Gadowski (bio engineering)

MECH\_SE 4 Guest Lecture from Dr. David Prawel (3-d printing)

MECH\_SE 5 Guest Lecture from Dr. Bernie Rollin (ethics)

MECH\_SE 6 Visit from Formula SAE team captains

MECH\_SE 7 Visit from ASME student chapter

MECH\_SE 8 Learning about units and dimensions

MECH\_SE 9 Learning about engineering fundamentals (pressure, work, energy)

MECH\_SE 10 Learning about dimensional analysis

MECH\_SE 11 Learning about important models in engineering (linear, power, exponential)

MECH\_SE 12 Learning how to use Microsoft Excel

MECH\_SE 13 Learning how to use Matlab