

# Report on Senior Surveys for Academic Year 2019-2020

Survey of Undergraduate Degree Applications for  
Aug 2019, Dec 2019 & May 2020 Graduation Dates  
Results for Industrial and Operations Engineering (IOE)

Produced by  
The Office of Student Affairs  
University of Michigan, College of Engineering  
Tuesday, July 14, 2020

## **Purpose and Approach**

Each year, the College of Engineering (CoE) conducts a Senior Survey of degree applicants in our undergraduate programs. The Office of Student Affairs distributes, collects, and processes the surveys on behalf of the undergraduate programs. The survey's purpose is to provide departments with assessment data from recent graduates. When combined with other types of assessment data, results from the annual senior survey can help departments identify strengths in their undergraduate programs and opportunities for improvement.

## **Methods**

### *Identifying Recipients*

Queries into U-M's online system for submission of degree applications identified CoE and Computer Science in Literature, Sciences, and Arts degree applications. Each semester, a query identified the degree applicants for the current term, which became the list of survey recipients for the semester. Each degree applicant's official U-M email address was compiled into the address list.

### *Distribution and Collection*

The Office of Student Affairs sent email invitations to every CoE degree applicant about four to six weeks before the end of the semester. An email reminder was sent once, a week before closing the survey. As an incentive to complete the survey, respondents who completed the survey were entered in a drawing to win several \$500 gift cards to U-M Computer Showcase. Response rates by survey year are in the graph on the next page.

## **Analysis**

Analysis has been completed only for fixed-response items. Fixed-response items are questions on which respondents were forced to choose from fixed, existing alternatives similar to a multiple-choice test.

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Survey of Undergraduate Degree Applications for

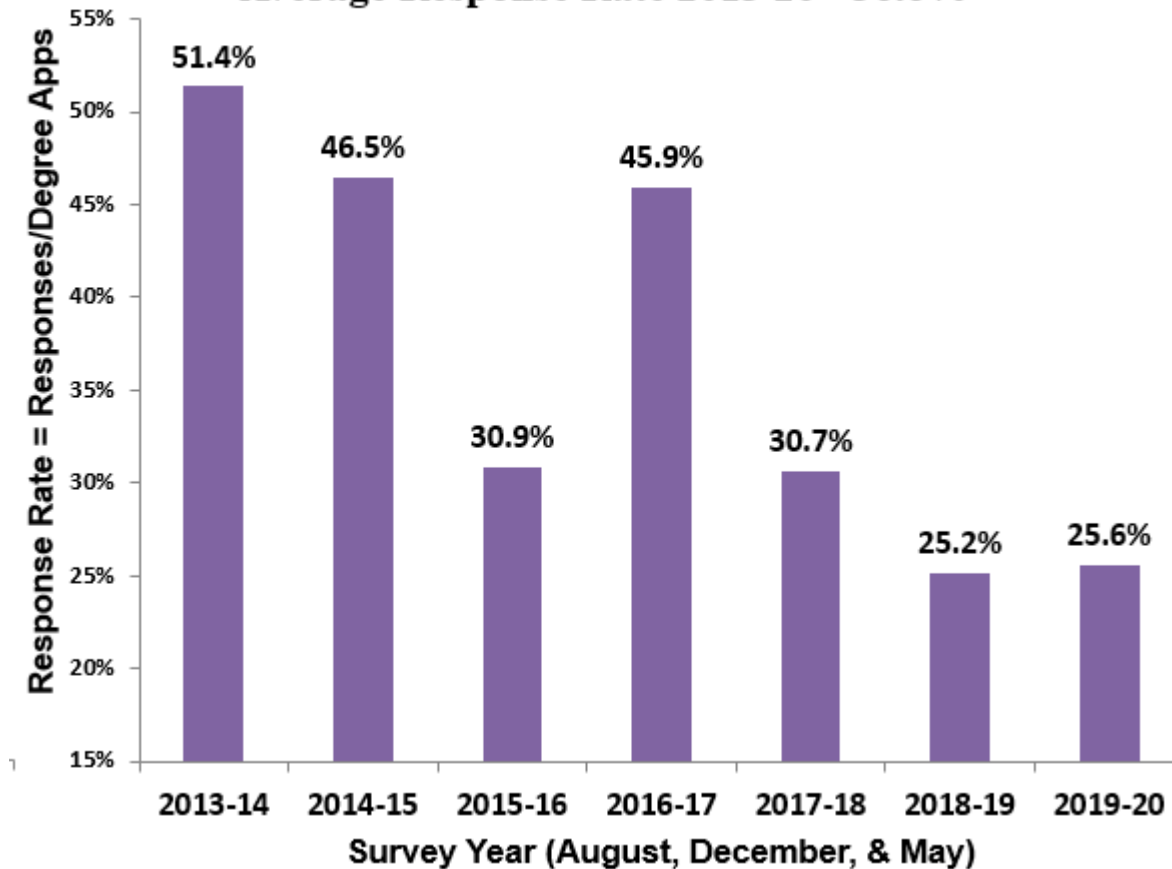
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### Analysis (continued)

Free-response items are questions that allow the recipient to compose their own response, similar to a short-answer test. To allow each reader of this report to interpret degree applicants' comments for themselves, comments are listed in the reports in alphabetical order by question. The comments are verbatim, with the exception of replacing the names of individuals with dashes (e.g., "Dr. John Smith" is listed as "Dr. ---- ----"). Comments are listed in the reports for specific programs, but not in the report for the College of Engineering Overall.

**Senior Survey Response Rates  
by Survey Year (CoE Overall)  
Average Response Rate 2013-20= 36.6%**



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## Results

Responses from degree applications in the semester(s) and program(s) listed above 40

Degree applications from students in the semester(s) and program(s) listed above: 183

Response Rate (responses/ degree applications): 21.9%

Degrees granted to undergraduates in the semester(s) and program(s) listed above: 184

**Note: Response Ratios (below) are calculated for respondents to that particular question.**

### PART I. EDUCATIONAL BACKGROUND

1. How did you enter the U-M College of Engineering or CSLSA? As a:		
	Number of Responses	Response Ratio
First year student (freshman), first time in college	35	88%
Transfer student from a two-year college	0	0%
Transfer student from a four-year college	2	5%
Transfer student from another U-M school or college	3	8%
Totals	40	100%

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<b>2. What is your undergraduate major? (Check all that apply)</b>		
	Number of Responses	Response Ratio
Aerospace Engineering	0	0%
Biomedical Engineering	0	0%
Chemical Engineering	0	0%
Civil Engineering	0	0%
Climate and Space Sciences and Engin	0	0%
Computer Engineering	0	0%
Computer Science Engineering	0	0%
Computer Science LSA	0	0%
Data Science	0	0%
Electrical Engineering	0	0%
Engineering Physics	0	0%
Environmental Engineering	0	0%
Industrial and Operations Engineering	40	100%
Materials Science and Engineering	0	0%
Mechanical Engineering	0	0%
Naval Architecture and Marine Engineering	0	0%
Nuclear Engineering and Radiological Sciences	0	0%
Other (please specify):	1	3%
<b>Totals</b>	<b>40</b>	<b>100%</b>

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### 3. When did you decide on your engineering major?

	Number of Responses	Response Ratio
Prior to first year (=0)	11	28%
First year (=1)	9	22%
Second year (=2)	18	45%
Third year (=3)	2	5%
Mean = 1.3	Totals	40
		100%

### 4. Will you complete a minor from the College of Engineering or from the College of Literature, Science, and the Arts?

	Number of Responses	Response Ratio
No	22	55%
Yes (please specify):	18	45%
	Totals	40
		100%

### 5. How many credits did you take in an average semester?

	Number of Responses	Response Ratio
Less than 12 credits/semester	1	3%
12-14 credits/semester	17	44%
15-17 credits/semester	21	54%
18+ credits/semester	0	0%
	Totals	39
		100%

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## PART II. CURRICULUM

### 6. How well did your high school science and math courses prepare you for your studies at U-M?

	Number of Responses	Response Ratio
Excellent Preparation (=5)	6	16%
Good Preparation (=4)	20	54%
Adequate Preparation (=3)	7	19%
Unsatisfactory Preparation (=2)	3	8%
No Preparation (=1)	1	3%
Mean = 3.7	Totals 37	100%

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### 7. How well did the following courses at U-M prepare you for your courses in engineering? (Select "N/A" (Not Applicable) for any categories in which you did not take classes at U-M.)

The percentage is the fraction of respondents giving the specific response to the given question. In bold is number of respondents.	5 =	4 =	3 =	2 =	1 =	N/A =	Response Ratio
	Excellent Preparation	Good Preparation	Adequate Preparation	Unsatisfactory Preparation	No Preparation	Not Applicable	Total Responses Mean
First Year Math (e.g., 105, 115/116)	14% <b>5</b>	27% <b>10</b>	22% <b>8</b>	14% <b>5</b>	0% <b>0</b>	24% <b>9</b>	100% <b>37</b> <b>3.5</b>
Sophomore Math (e.g., 214/215/216)	14% <b>5</b>	43% <b>16</b>	24% <b>9</b>	8% <b>3</b>	0% <b>0</b>	11% <b>4</b>	100% <b>37</b> <b>3.7</b>
Chemistry (e.g., 125/126/130 or 210/211)	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	100% <b>0</b>
Physics (e.g., 140/240)	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	100% <b>0</b>
Intro to Computers and Programming (ENG 101)	32% <b>12</b>	41% <b>15</b>	16% <b>6</b>	0% <b>0</b>	5% <b>2</b>	5% <b>2</b>	100% <b>37</b> <b>4</b>
Intro to Engineering (ENG 100)	38% <b>14</b>	35% <b>13</b>	14% <b>5</b>	0% <b>0</b>	3% <b>1</b>	11% <b>4</b>	100% <b>37</b> <b>4.2</b>
College Writing (English 125)	0% <b>0</b>	11% <b>4</b>	11% <b>4</b>	3% <b>1</b>	3% <b>1</b>	73% <b>27</b>	100% <b>37</b> <b>3.1</b>

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### 8. Please rate how important you predict the following competencies and attitudes will be to you in your PROFESSIONAL CAREER.

The percentage is the fraction of respondents giving the specific response to the given question. In bold is number of respondents.	5 = Extremely Important	4 = Quite Important	3 = Somewhat Important	2 = Slightly Important	1 = Not at all Important	Response Ratio <b>Total Responses</b>  <b>Mean</b>
Math, science and engineering skills	35% <b>13</b>	30% <b>11</b>	30% <b>11</b>	5% <b>2</b>	0% <b>0</b>	100% <b>37</b> <b>3.9</b>
Ability to design and conduct experiments	14% <b>5</b>	35% <b>13</b>	24% <b>9</b>	14% <b>5</b>	14% <b>5</b>	100% <b>37</b> <b>3.2</b>
Ability to analyze and interpret data	95% <b>35</b>	5% <b>2</b>	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	100% <b>37</b> <b>4.9</b>
Ability to design a system, component or process	28% <b>10</b>	36% <b>13</b>	19% <b>7</b>	14% <b>5</b>	3% <b>1</b>	100% <b>36</b> <b>3.7</b>
Ability to function on a team	95% <b>35</b>	5% <b>2</b>	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	100% <b>37</b> <b>4.9</b>
Engineering problem solving skills	76% <b>28</b>	16% <b>6</b>	3% <b>1</b>	5% <b>2</b>	0% <b>0</b>	100% <b>37</b> <b>4.6</b>
Understanding of professional and ethical responsibility	59% <b>22</b>	32% <b>12</b>	5% <b>2</b>	3% <b>1</b>	0% <b>0</b>	100% <b>37</b> <b>4.5</b>
Written communication skills	54% <b>20</b>	43% <b>16</b>	3% <b>1</b>	0% <b>0</b>	0% <b>0</b>	100% <b>37</b> <b>4.5</b>
Oral communication skills	62% <b>23</b>	38% <b>14</b>	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	100% <b>37</b> <b>4.6</b>



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<b>8. Please rate how important you predict the following competencies and attitudes will be to you in your PROFESSIONAL CAREER. (continued)</b>						
The percentage is the fraction of respondents giving the specific response to the given question. In bold is number of respondents.	5 = Extremely Important	4 = Quite Important	3 = Somewhat Important	2 = Slightly Important	1 = Not at all Important	Response Ratio <b>Total Responses</b>  <b>Mean</b>
Understanding of the social, economic and environmental impact of my work	19% <b>7</b>	57% <b>21</b>	16% <b>6</b>	8% <b>3</b>	0% <b>0</b>	100% <b>37</b> <b>3.9</b>
Ability to continue formal or informal learning	42% <b>15</b>	42% <b>15</b>	17% <b>6</b>	0% <b>0</b>	0% <b>0</b>	100% <b>36</b> <b>4.2</b>
Knowledge of contemporary issues that affect my work	22% <b>8</b>	57% <b>21</b>	22% <b>8</b>	0% <b>0</b>	0% <b>0</b>	100% <b>37</b> <b>4</b>
Ability to use modern engineering techniques, skills & tools	30% <b>11</b>	49% <b>18</b>	16% <b>6</b>	5% <b>2</b>	0% <b>0</b>	100% <b>37</b> <b>4</b>

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### 9. Please rate how well you feel your UNDERGRADUATE PROGRAM at the University of Michigan prepared you in the following competencies and attitudes.

The percentage is the fraction of respondents giving the specific response to the given question. In bold is number of respondents.	5 = Excellent Preparation	4 = Good Preparation	3 = Adequate Preparation	2 = Unsatisfactory Preparation	1 = Poor Preparation	Response Ratio <b>Total Responses</b>  <b>Mean</b>
An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	48% <b>16</b>	48% <b>16</b>	3% <b>1</b>	0% <b>0</b>	0% <b>0</b>	100% <b>33</b> <b>4.5</b>
An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	36% <b>12</b>	36% <b>12</b>	21% <b>7</b>	6% <b>2</b>	0% <b>0</b>	100% <b>33</b> <b>4</b>
An ability to communicate effectively with a range of audiences	42% <b>14</b>	48% <b>16</b>	6% <b>2</b>	3% <b>1</b>	0% <b>0</b>	100% <b>33</b> <b>4.3</b>
An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts	24% <b>8</b>	48% <b>16</b>	24% <b>8</b>	0% <b>0</b>	3% <b>1</b>	100% <b>33</b> <b>3.9</b>

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The percentage is the fraction of respondents giving the specific response to the given question. In bold is number of respondents.	5 = Excellent Preparation	4 = Good Preparation	3 = Adequate Preparation	2 = Unsatisfactory Preparation	1 = Poor Preparation	Response Ratio <b>Total Responses</b>  <b>Mean</b>
Ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	73% <b>24</b>	21% <b>7</b>	3% <b>1</b>	0% <b>0</b>	3% <b>1</b>	100% <b>33</b> <b>4.6</b>
An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	48% <b>16</b>	42% <b>14</b>	9% <b>3</b>	0% <b>0</b>	0% <b>0</b>	100% <b>33</b> <b>4.4</b>
An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	45% <b>15</b>	42% <b>14</b>	12% <b>4</b>	0% <b>0</b>	0% <b>0</b>	100% <b>33</b> <b>4.3</b>

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### 10. How well were the courses in your curriculum integrated with each other (e.g., how well did prerequisites prepare you for subsequent courses)?

	Number of Responses	Response Ratio
Excellent Integration (=5)	3	8%
Good Integration (=4)	22	59%
Adequate Integration (=3)	11	30%
Unsatisfactory Integration (=2)	1	3%
No Integration (=1)	0	0%
Mean = 3.7	Totals 37	100%

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## 11. How important do you feel the following elements are for your learning in an engineering course?

The percentage is the fraction of respondents giving the specific response to the given question. In bold is number of respondents.	5 = Extremely Important	4 = Quite Important	3 = Somewhat Important	2 = Slightly Important	1 = Not at all Important	Response Ratio <b>Total Responses</b> <b>Mean</b>
Small class size	16% <b>6</b>	22% <b>8</b>	30% <b>11</b>	22% <b>8</b>	11% <b>4</b>	100% <b>37</b> <b>3.1</b>
Taught by a professor	41% <b>15</b>	30% <b>11</b>	19% <b>7</b>	3% <b>1</b>	8% <b>3</b>	100% <b>37</b> <b>3.9</b>
Quality of the lecture	65% <b>24</b>	27% <b>10</b>	5% <b>2</b>	0% <b>0</b>	3% <b>1</b>	100% <b>37</b> <b>4.5</b>
Quality of the discussions	30% <b>11</b>	19% <b>7</b>	19% <b>7</b>	22% <b>8</b>	11% <b>4</b>	100% <b>37</b> <b>3.4</b>
Quality of the homework and exams	41% <b>15</b>	46% <b>17</b>	14% <b>5</b>	0% <b>0</b>	0% <b>0</b>	100% <b>37</b> <b>4.3</b>
Accessibility of the professor	30% <b>11</b>	43% <b>16</b>	14% <b>5</b>	11% <b>4</b>	3% <b>1</b>	100% <b>37</b> <b>3.9</b>
Accessibility of the GSI	30% <b>11</b>	38% <b>14</b>	19% <b>7</b>	11% <b>4</b>	3% <b>1</b>	100% <b>37</b> <b>3.8</b>

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**12. What was your best course in engineering? Why?**

Number of Responses:	33
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Responses listed on subsequent pages.

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### PART III. CO-CURRICULAR ACTIVITIES

**13. Which of the following activities/programs did you participate in during your time at U-M? (Check all that apply.)**

	Number of Responses	Response Ratio
No participation in programs/activities outside of the requirements for my academic degree(s)	2	1%
Professional Societies (e.g., ASME, AIAA)	10	7%
Honor Societies (e.g., Eta Kappa Nu, Tau Beta Pi)	9	6%
Project Teams (e.g., Solar Car, Steel Bridge)	9	6%
Community Service	14	10%
Student Government (e.g., UMEC, MSA)	2	1%
Sports (Intercollegiate or Club)	10	7%
Music Performance (e.g., Marching Band, Glee Club)	2	1%
Religious Organizations	5	3%
Undergraduate Research Project	7	5%
Study Abroad	12	8%
Co-Op	6	4%
Internship	30	21%
Months or years experience in Co-op/Internship:	22	15%
Other	6	4%
<b>Totals</b>	<b>146</b>	<b>100%</b>

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### 14. Indicate below how many hours, on average, you worked (including work study) during the terms in which you were taking classes.

	Number of Responses	Response Ratio
No job	7	19%
0-10 hours/week	18	49%
10-20 hours/week	8	22%
20+ hours/week	4	11%
Totals	37	100%



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## PART IV. SUPPORT SERVICES AND ENVIRONMENT

### 15. How satisfied were you with the following aspects of the DEPARTMENT in which you did your primary major?

The percentage is the fraction of respondents giving the specific response to the given question. In bold is number of respondents.	5 = Extremely Satisfied	4 = Satisfied	3 = Neutral	2 = Dissatisfied	1 = Extremely Dissatisfied	Response Ratio <b>Total Responses</b> <b>Mean</b>
Academic advising	59% <b>22</b>	30% <b>11</b>	5% <b>2</b>	3% <b>1</b>	3% <b>1</b>	100% <b>37</b> <b>4.4</b>
Career guidance from faculty	19% <b>7</b>	38% <b>14</b>	35% <b>13</b>	5% <b>2</b>	3% <b>1</b>	100% <b>37</b> <b>3.6</b>
Instruction by faculty	24% <b>9</b>	68% <b>25</b>	5% <b>2</b>	3% <b>1</b>	0% <b>0</b>	100% <b>37</b> <b>4.1</b>
Accessibility of faculty	38% <b>14</b>	57% <b>21</b>	5% <b>2</b>	0% <b>0</b>	0% <b>0</b>	100% <b>37</b> <b>4.3</b>
Contact with faculty	32% <b>12</b>	46% <b>17</b>	22% <b>8</b>	0% <b>0</b>	0% <b>0</b>	100% <b>37</b> <b>4.1</b>
Instruction by graduate students (GSI's)	19% <b>7</b>	46% <b>17</b>	22% <b>8</b>	11% <b>4</b>	3% <b>1</b>	100% <b>37</b> <b>3.7</b>
Accessibility of GSI's	28% <b>10</b>	61% <b>22</b>	11% <b>4</b>	0% <b>0</b>	0% <b>0</b>	100% <b>36</b> <b>4.2</b>
Percentage of teaching by faculty	24% <b>9</b>	46% <b>17</b>	19% <b>7</b>	11% <b>4</b>	0% <b>0</b>	100% <b>37</b> <b>3.8</b>
Contact with staff	28% <b>10</b>	50% <b>18</b>	22% <b>8</b>	0% <b>0</b>	0% <b>0</b>	100% <b>36</b> <b>4.1</b>
Sense of community among students	16% <b>6</b>	46% <b>17</b>	35% <b>13</b>	3% <b>1</b>	0% <b>0</b>	100% <b>37</b> <b>3.8</b>

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### 15. How satisfied were you with the following aspects of the DEPARTMENT in which you did your primary major? (continued)

The percentage is the fraction of respondents giving the specific response to the given question. In bold is number of respondents.	5 = Extremely Satisfied	4 = Satisfied	3 = Neutral	2 = Dissatisfied	1 = Extremely Dissatisfied	Response Ratio <b>Total Responses</b> <b>Mean</b>
Research opportunities	14% <b>5</b>	35% <b>13</b>	35% <b>13</b>	14% <b>5</b>	3% <b>1</b>	100% <b>37</b> <b>3.4</b>
Classroom facilities	32% <b>12</b>	35% <b>13</b>	24% <b>9</b>	8% <b>3</b>	0% <b>0</b>	100% <b>37</b> <b>3.9</b>
Lab facilities	22% <b>8</b>	41% <b>15</b>	30% <b>11</b>	8% <b>3</b>	0% <b>0</b>	100% <b>37</b> <b>3.8</b>
Computing facilities	43% <b>16</b>	30% <b>11</b>	16% <b>6</b>	8% <b>3</b>	3% <b>1</b>	100% <b>37</b> <b>4</b>
Overall experience with your department	27% <b>10</b>	65% <b>24</b>	8% <b>3</b>	0% <b>0</b>	0% <b>0</b>	100% <b>37</b> <b>4.2</b>

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### 16. How satisfied were you with the CENTRAL student services in the College of Engineering? (Select "N/A" (Not Applicable) for any categories with which you had no experience while at U-M.)

The percentage is the fraction of respondents giving the specific response to the given question. In bold is number of respondents.	5 = Extremely Satisfied	4 = Satisfied	3 = Neutral	2 = Dissatisfied	1 = Extremely Dissatisfied	N/A = Not Applicable	Response Ratio  Total Responses  Mean
Academic advising in the Engineering Advising Center (EAC)	25% <b>9</b>	25% <b>9</b>	14% <b>5</b>	17% <b>6</b>	3% <b>1</b>	17% <b>6</b>	100% <b>36</b> <b>3.6</b>
Tutoring or academic assistance	6% <b>2</b>	33% <b>12</b>	14% <b>5</b>	6% <b>2</b>	0% <b>0</b>	42% <b>15</b>	100% <b>36</b> <b>3.7</b>
Information provided to support you in choosing an engineering major	17% <b>6</b>	31% <b>11</b>	31% <b>11</b>	11% <b>4</b>	3% <b>1</b>	8% <b>3</b>	100% <b>36</b> <b>3.5</b>
Engineering Scholarship Office services	3% <b>1</b>	25% <b>9</b>	17% <b>6</b>	11% <b>4</b>	0% <b>0</b>	44% <b>16</b>	100% <b>36</b> <b>3.4</b>
Career services (e.g. co-op, internship, permanent job)	11% <b>4</b>	47% <b>17</b>	19% <b>7</b>	6% <b>2</b>	3% <b>1</b>	14% <b>5</b>	100% <b>36</b> <b>3.7</b>
Personal counseling services	3% <b>1</b>	19% <b>7</b>	14% <b>5</b>	6% <b>2</b>	0% <b>0</b>	58% <b>21</b>	100% <b>36</b> <b>3.5</b>
Contact with student services staff	8% <b>3</b>	28% <b>10</b>	11% <b>4</b>	3% <b>1</b>	0% <b>0</b>	50% <b>18</b>	100% <b>36</b> <b>3.8</b>
Sense of community in the College	14% <b>5</b>	36% <b>13</b>	36% <b>13</b>	8% <b>3</b>	0% <b>0</b>	6% <b>2</b>	100% <b>36</b> <b>3.6</b>
Computing facilities	36% <b>13</b>	39% <b>14</b>	14% <b>5</b>	6% <b>2</b>	0% <b>0</b>	6% <b>2</b>	100% <b>36</b> <b>4.1</b>

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### 17. Did you have a mentor (official or unofficial) who took a personal interest in your educational development? (Check all that apply.)

	Number of Responses	Response Ratio
Professor	7	14%
Graduate Student Instructor (GSI)	2	4%
Staff member	2	4%
Peer	11	22%
Alumna or alumnus	4	8%
No mentor	21	42%
Other (please specify):	3	6%
Totals	50	100%

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<b>18. To what extent do you think the College is a supportive climate for:</b>					
The percentage is the fraction of respondents giving the specific response to the given question. In bold is number of respondents.	3 = Very Supportive	2 = Supportive	1 = Not Supportive	Not Applicable	Response Ratio <b>Total Responses</b> <b>Mean</b>
Women	38% <b>14</b>	54% <b>20</b>	8% <b>3</b>	0% <b>0</b>	100% <b>37</b> <b>2.3</b>
Students of color	35% <b>13</b>	32% <b>12</b>	16% <b>6</b>	16% <b>6</b>	100% <b>37</b> <b>2.2</b>
Diverse religious views	38% <b>14</b>	41% <b>15</b>	14% <b>5</b>	8% <b>3</b>	100% <b>37</b> <b>2.3</b>
Students from lower income families	35% <b>13</b>	30% <b>11</b>	22% <b>8</b>	14% <b>5</b>	100% <b>37</b> <b>2.2</b>
Gay, lesbian, bisexual students	35% <b>13</b>	49% <b>18</b>	5% <b>2</b>	11% <b>4</b>	100% <b>37</b> <b>2.3</b>
International students	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	100% <b>0</b>
Students with disabilities	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	0% <b>0</b>	100% <b>0</b>

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## PART V. FUTURE PLANS AND INTERESTS

### 19. What are your EDUCATIONAL plans after graduation?

	Number of Responses	Response Ratio
No plans for further formal education	12	33%
Military	0	0%
Graduate School (select the educational plan below)	15	42%
Professional School (select the educational plan below)	0	0%
Master's outside of engineering (and not an MBA)	3	8%
J.D.(Law)	0	0%
M.D.(Medicine)	0	0%
Doctorate in an engineering field	0	0%
Doctorate outside of engineering	0	0%
School attending &/or other formal degree pursuing	6	17%
Totals	36	100%

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### 20. What are your **EMPLOYMENT** plans after graduation? (Check all that apply.)

	Number of Responses	Response Ratio
No plans for employment after graduation	1	3%
Entrepreneurial ventures/self employed business owner	1	3%
Military	0	0%
Volunteer Experience	0	0%
Accepted full-time employment (select the employment plan below)	25	71%
Accepted part-time employment (select the employment plan below)	1	3%
Still seeking employment	6	17%
Other (please specify):	1	3%
<b>Totals</b>	<b>35</b>	<b>100%</b>

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**21. What is the name of the employer you accepted a position with after graduation? Please also list additional offers you received.**

Number of Responses:	26
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For additional employer information, such as location, starting salary, and other salary offers, contact UM CoE's Engineering Career Resource Center (ECRC).

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<b>22. How did you learn about the employment position you accepted?</b>		
	Number of Responses	Response Ratio
Career fair	5	18%
Classified ad	0	0%
Company Day	0	0%
Departmental career fair	1	4%
Direct inquiry	0	0%
Faculty	1	4%
Family/friends	0	0%
ENGenius.Jobs	1	4%
ENGenius.Jobs on-campus recruiting	1	4%
Internship Fair	0	0%
Job posting	2	7%
Networking	2	7%
Online	1	4%
Organization/club	3	11%
Previous internship/co-op	8	29%
Other, please specify	3	11%
<b>Totals</b>	<b>28</b>	<b>100%</b>

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**23. If you plan to be employed in ENGINEERING OR ENGINEERING-RELATED WORK after graduation, which phrase(s) BEST describe the work you plan to do? (Check all that apply.)**

	Number of Responses	Response Ratio
Consulting engineer	7	18%
Design engineer	0	0%
Faculty member	0	0%
Manager of engineers	1	3%
Process or industrial engineer	13	33%
Product engineer	0	0%
Project manager/project leader	5	13%
Quality engineer	2	5%
Researcher	0	0%
Sales engineer/technical sales	1	3%
Software developer/programmer	2	5%
Systems analyst/systems engineer	4	10%
Test engineer/field engineer	0	0%
If not listed above, provide the title of position	4	10%
<b>Totals</b>	<b>39</b>	<b>100%</b>

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## PART VI. PERSONAL BACKGROUND

### 24. What is your approximate Grade Point Average (GPA)?

	Number of Responses	Response Ratio
3.51-4.0	20	56%
3.01-3.5	13	36%
2.51-3.0	2	6%
2.01-2.5	1	3%
2.0 or below	0	0%
Totals	36	100%

### 25. Did you receive financial aid and/or scholarships while a student in the College of Engineering? (Check all that apply.)

	Number of Responses	Response Ratio
Financial aid	16	47%
Scholarships	18	53%
Totals	34	100%

### 26. What is your Gender?

	Number of Responses	Response Ratio
Female	20	56%
Male	16	44%
Other	0	0%
Totals	36	100%

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### 27. Race/Ethnicity: Choose which best describes you (optional)

	Number of Responses	Response Ratio
2 or more	1	3%
Hispanic or Latino (including Spain)	3	9%
American Indian or Alaska Native (including all Original Peoples of the Americas)	0	0%
Asian (including Indian subcontinent and Philippines)	5	14%
Black or African American (including Africa and Caribbean)	1	3%
Native Hawaiian or Other Pacific Islander (Original Peoples)	0	0%
White (including Middle Eastern)	25	71%
Totals	35	100%

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### PART VII. EVALUATION OF YOUR ENTIRE UNDERGRADUATE PROGRAM

#### 28. Overall, how satisfied are you with:

The percentage is the fraction of respondents giving the specific response to the given question. In bold is number of respondents.	5 = Very Satisfied	4 = Satisfied	3 = Neutral	2 = Dissatisfied	1 = Very dissatisfied	N/A = Not Applicable	Response Ratio
							<b>Total Responses</b>
							<b>Mean</b>
Your undergraduate educational experience at the University of Michigan	50% <b>18</b>	42% <b>15</b>	6% <b>2</b>	3% <b>1</b>	0% <b>0</b>	0% <b>0</b>	100% <b>36</b> <b>4.4</b>
The career services offered to you by the College of Engineering	31% <b>11</b>	42% <b>15</b>	14% <b>5</b>	11% <b>4</b>	0% <b>0</b>	3% <b>1</b>	100% <b>36</b> <b>3.9</b>

## Report on Senior Surveys for Academic Year 2019-2020

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**29. Overall, what aspects of your experience in the College of Engineering have you found to be MOST VALUABLE and LEAST VALUABLE? Please be specific. Share any other comments you would like to make, such as recommendations for specific changes, comments about quality of life as a CoE student, or descriptions of significant challenges you faced.**

Number of Responses:	25
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Responses listed on subsequent pages.

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### 2. What is your undergraduate major? (Check all that apply)

Number of Responses:

1

Business

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## 4. Will you complete a minor from the College of Engineering or from the College of Literature, Science, and the Arts?

Number of Responses:	17
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Business

Business Administration

Computer Science

Computer Science

Computer Science

Economics

English

Entrepreneurship

Entrepreneurship

International Minor for Engineers

International minor for engineers

International Minor for Engineers

International Minor for Engineers

International Minor

International Programs in Engineering

Music Minor

Program in Sustainable Engineering

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## 12. What was your best course in engineering? Why?

Number of Responses:

33

By far my favorite course was IOE 310 because while learning how to linear program isn't especially easy, it was very useful when using things like Excel OpenSolver for other courses, student organizations, or even jobs.

EECS 280 - I learned so much and the class was interesting, challenging, well run

EECS 280 or 281, because I learned a lot of very important and relevant skills and technologies, it made me want to pursue a career in CS, and I was far enough into college to take it seriously and do well.

eng 100 cause it showed me that I wanted to major in IOE. I knew I wanted to be an engineer, I just didnt know which one. Then I found IOE and fell in love

Engineering 101 was the best structured class, given the high volume of students taking it a semester as well as the inexperienced backgrounds of students.

ENGR 100

ENGR100 with Professor ---- as your techcomm professor. No matter what you end up majoring in, this will prepare you well.

I really enjoyed engineering 101. I had ---- and you could tell that he cared about teaching, loved being there, and deeply understood the need for what he was teaching. I also really enjoyed my MSE 220 instructor and also an elective, CLASP 405

I really enjoyed IOE 440 as it pushed me to explore applications of the course outside of the course

IOE 201/202 because it set up the basics for finance and linear problem solving.

IOE 310. I loved the material and my professor was incredible.

IOE 310. I took it with Dr. ---- who is one of the best lecturers I ever had and managed to break down difficult concepts into small, bite-sized chunks. She also took the time to make a genuine connection with every student and clearly truly cared about every student she was teaching, which is very rare at UM. I really felt more confident in my abilities to apply math to problems after the course.

IOE 316 my professor made things interesting and relevant. While also keeping them simple and explaining things clearly.

IOE 316. It was taught by 3 very intelligent GSIs that each could explain a problem in different ways. They also had lecture set up so we would have two lectures of learning and then the third lecture would be a "lab" that was just a bunch of application problem that we went over and figured out as a class.

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### 12. What was your best course in engineering? Why?

IOE 373 because it taught us how to work with big data and use programming languages like VBA, SQL, and Python. I used everything I learned in this class at my internships. I wish the IOE department would have more courses like this one. There aren't enough real-world application classes.

IOE 373 most relevant

IOE 373 was the best course I took as it gave me incredibly tangible skills that I was able to apply not only to my coursework but my two professional internships. Additionally, it was the course that sparked my interest in Data & Analytics.

IOE 373 was the best course I took because it advanced my understanding of data science through the use of excel and Microsoft Access is an extremely practical way that I can see myself using in the real world.

IOE 425 by content was the best course (and I think it should be required for IOE majors) although the teaching was sub-par. While not a super technical class, it teaches a lot about how to work together and improve a business and I think it's super useful no matter what job you end up going into

IOE 430 - Global Cultural Engineering, because it was a less traditional class and it was interesting.

IOE 430 because it taught me the ability to apply engineering to modern life and other aspects of professional work besides in typical realms like manufacturing, analysis, experiments, and optimization.

IOE 430 or IOE 461. Because of the professors.

IOE 447 Facility Planning

IOE 461

IOE 461 - very applicable to real world, approachable professor and GSI, right amount of hw and exams

IOE 461 with Professor ----. This was the first class I took where I saw not only a direct connection to real world and industry, but the cases and problems we were solving were explaining not just using math or theory, but with real world examples that the Professor had experienced himself. He was extremely purposeful and every lecture was worth listening to, this was by far the best and my favorite course in engineering.

IOE 461, Lectures and slides were great and informative. The class was taught in a very structured way that made it much easier to retain knowledge

IOE 461. The data analysis methods are very applicable.

IOE 461. The professor was extremely engaging & made the course seem relevant to many things in real life. The homework actually seemed like it was something you would work on in a real job & it seemed like I actually learned something very practical in this course

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### 12. What was your best course in engineering? Why?

IOE424 - Senior Design, got lots of practical experience with a real world sponsor

My best course was definitely Engineering 100. It showed me what it takes to be an engineer and ultimately helped me decide which branch of engineering I wanted to pursue. You learn everything in that course from technical work to technical communication.

My favorite course was IOE 316 because I was most interested in the content and the instructor was very personable and accessible. I also enjoyed IOE 430 for similar reasons (professor was funny and engaging with interesting course content). Other courses I really liked were ENGR 101 (great instruction, interesting projects) and IOE 202 (great instruction, relevant content).

My IOE 373 course was my best engineering course. The combination of lectures and labs were very effective in teaching me how to use SQL, Python, and Microsoft VBA. The GSIs and the professor were also very competent teachers and extremely approachable/friendly. This made for a great learning environment.

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**13. Which of the following activities/programs did you participate in during your time at U-M? (Check all that apply.)**

Number of Responses: 6

AKPsi Professional Business Fraternity

CHEPS

Intramural Sports

Social Fraternity

Social Sorority

Sorority

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**17. Did you have a mentor (official or unofficial) who took a personal interest in your educational development? (Check all that apply.)**

Number of Responses: 3

Academic advisor

My academic advisor my freshman year was amazing

My project team lead from INFORMS

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**19. What are your EDUCATIONAL plans after graduation?**

Number of Responses: 6

MBA

MBA

MBA

MBA

MSE in IOE at UofM

Unsure, will decide after working for a bit.

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**20. What are your EMPLOYMENT plans after graduation? (Check all that apply.)**

Number of Responses: 1

Pursuing graduate school

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**21. What is the name of the employer you accepted a position with after graduation? Please also list additional offers you received.**

Number of Responses:

2

0

73000



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**22. How did you learn about the employment position you accepted?**

Number of Responses: 3

Department-wide email

Handshake

Through baseball

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**23. If you plan to be employed in ENGINEERING OR ENGINEERING-RELATED WORK after graduation, which phrase(s) BEST describe the work you plan to do? (Check all that apply.)**

Number of Responses: 4

Business Consulting using IOE-related tools

Data Analyst/Sales specific

Investment Management Analyst

Supply Chain/Logistics

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**26. What is your Gender?**

Number of Responses: 1

transgender male

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**29. Overall, what aspects of your experience in the College of Engineering have you found to be MOST VALUABLE and LEAST VALUABLE? Please be specific. Share any other comments you would like to make, such as recommendations for specific changes, comments about quality of life as a CoE student, or descriptions of significant challenges you faced.**

Number of Responses:

25

---- in my IOE capstone was the worst course I have ever taken

Getting in touch with different departments, being part of various projects/programs/advisors is certainly a very useful resource that the university offers. By reaching out to several people, you can discover endless opportunities. As for the Career Fair, it does not work the way I would have envisioned it. Some companies do have on-site interviews, whereas others tell you to apply online after waiting in the line for 45 mins. There can be more opportunities implement for talking to the recruiters in-person.

I found all my internship experiences on my own. The Fall and Winter Career Fairs and the ECRC did not help. As an IOE, I can say that the career fairs are the most inefficient processes and that's why I stopped going to them after freshman year. Each department needs to have their own career fairs (like IOE does). I wish my department and its faculty would help its students find jobs; however, I think my department does a great job of having faculty with diverse experiences and research interests. CoE fostered a community for me and provided a space for collaboration and learning.

I found my group project experiences (such as Engineering 100, Senior Design, and other group projects) to be most valuable in attaining employment. They were something I could talk about in interviews and put in my cover letters. I also thought the little programming knowledge I gained from Engineering 101, Physics 141, Physics 241, and some IOE classes such as IOE 373 were valuable as well. However, I felt that for IOE students the introductory science classes such as Chemistry 130, Physics 140 (with the small exception of a particular topic pertaining to torque our Ergonomics class IOE 333), and Physics 240 were largely. Even some math courses seemed invaluable to us in our IOE major. Math 214 provided an excess of linear algebra knowledge, much more than was needed for linear programming courses like IOE 310. Furthermore, Math 215 proved largely irrelevant in future IOE courses (with the small exception of the use of partial derivatives in IOE 366 I believe). Finally, while there were student organizations that provided support to minority students, I did not witness any attempts by faculty to demonstrate or vocalize support for minority students. I would have appreciated more explicit support for minority students in the College of Engineering. Even requiring engineering students to complete a Race/Ethnicity course (as LS&A students have to do) would be one way of demonstrating the College's values of Diversity, Equity, and Inclusion.

I found the classes and the professors in my department (IOE) to be very personal and caring. I also found the career fair to be very valuable. The part that I found to be least valuable was the College of Engineering career office because it felt impersonal. I wish that the college partnered us with a mentor right from the beginning that checked in on us throughout college to help guide our career.

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**29. Overall, what aspects of your experience in the College of Engineering have you found to be MOST VALUABLE and LEAST VALUABLE? Please be specific. Share any other comments you would like to make, such as recommendations for specific changes, comments about quality of life as a CoE student, or descriptions of significant challenges you faced.**

In my time in the college of engineering, I battled depression related to gender dysphoria, went through medical transition, developed ulnar neuropathy and lost the use of my left arm, and went through 2 related surgeries, lost family members to death or discrimination, and had several other health related difficulties. It was an incredible challenge to get through school having to deal with all of these things. I feel that the college of engineering really needs to do a better job supporting people who are going through extenuating circumstances. There were a few professors that I had who were incredible and worked with me to get material done despite needing to take time for surgeries etc, but overall I lost a lot of time due to not being helped despite really needing the support. The most valuable thing I learned in the college of engineering is that life does not stop for you no matter how difficult what you're going through is. I learned how to struggle and not give up, even if people judged me for it. I will take that with me going forward and use it as a way to get through difficult things in my career. The least valuable experience I had in the college of engineering was the material I learned in my non-major engineering classes.

It was incredibly hard for me to find a sense of community within the College of Engineering after transferring from the School of LS&A. Additionally, I do not feel I had adequate help during the transferring process. I wish my major had more clear 'specialization routes' within the requirements to graduate.

Most -- The professors and staff who go the extra mile and make classes worthwhile for students is one of the most valuable and lasting aspects of being at student at this University. These professors work to challenge students, while also making them realize the purpose behind what we are learning. The IOE advisory community was also always extremely helpful and welcoming, as well as the other students in my class. Least -- Some of the 300 levels in the IOE curriculum I felt were somewhat silly and not applicable to further areas of study. I think they could be replaced with other courses or students could be provided the option to take these or other classes. Additionally, I think communities like the IOE staff need to do a better job when planning exam dates, as throughout my 4 years at Michigan I definitely had 3 exams in 2 days more than once, which is simply unnecessary and caused excessive amounts of stress for students.

Most Valuable - Talking with professors for advice, advising through faculty, and research  
Least Valuable - Prereq courses outside of my major that are a waste of time for my development

Most valuable - alumni network  
Least valuable - support for freshmen

Most Valuable: culture of collaboration, advising help and resources, student orgs to participate in.  
Least Valuable: n/a, maybe less-than-ideal instruction for a few courses but nothing too bad. I think one thing that could be beneficial is to make undergrad research more open for non-UROP style programs. I applied to a bunch of research positions and never heard back from any of them. Friends had similar experiences. Wasn't a huge deal but it's the only thing I didn't get to experience that I wish I had.

Most Valuable: Faculty was great for the most part, course selection was awesome in IOE especially with the ability to get credit for Ross classes  
Least Valuable: Summer reading before Freshman year

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**29. Overall, what aspects of your experience in the College of Engineering have you found to be MOST VALUABLE and LEAST VALUABLE? Please be specific. Share any other comments you would like to make, such as recommendations for specific changes, comments about quality of life as a CoE student, or descriptions of significant challenges you faced.**

Most Valuable: Honors Program in EngineeringLeast Valuable: GSIs teaching courses

Most valuable: mentorship from alumni, resources at Michigan (funding for startups, labs, etc), the student teams, learning outside of classrooms, speaker series and events. I truly owned my experience despite the challenges and persevered.Least valuable: some of the weeder classes like MATH/PHYS. You don't optimize for course mastery but rather just busy work. It's sad that a community college teaches Calc better or a YouTuber teaches better - we pay too much to go here for that to happen. Career fair is not optimized either - its a hectic mess. I got jobs from networking because my GPA was too low for most companies. As a student who did poorly academically, I knew support existed but I feel like the system was rigged from the beginning. My success outside the classroom wasn't present in the classroom. I felt like the U at times didn't care about me. Everything was so rigid. I'm not advocating for a change to the entire system (would be great) but maybe engage your non-performing students in a way the recognizes other forms of learning (experiential, immersed, etc).

most valuable: project team experience

Most valuable: Receiving a diverse education with students who are wonderful and will change this earth. Being able to find others who care and will support me. Least Valuable: The attitude of professors. We are paying for them to be here, but because of the conflict of interest that the university provides many of them would much rather research. I dont blame them, I see many posters congratulating Professors on research, but if we took those same professors teaching ratings a different story would be told. I have really enjoyed most of my lecturers throughout my time, and they deserve to be paid more. They are inspiring the next generation. In truth, I have also had a amazing professors. I also find the level of difficulty to do something outside of a pre defined career path very frustrating. Getting approval for different courses and finding information on minors seems to be a here is a resource, go figure it out yourself. I have also find financial aid to be a game of we dont really know how your aid will be effected, and students pay the consequences of being left in limbo for positions such as being an RA

most: the professors were greatleast: none

professors need to change homeworks and exams from year to year because past year's files are all over the internet

Switching to IOE was the best decision I ever made

The career fair is extremely helpful, please continue to hold it and encourage all engineering departments to hold their own career fair! The academic advising for freshmen is amazing, please encourage students to use their advisors. I think that there wasn't one good place to go to learn about each of the different types of engineering majors and that would have been very beneficial to me as a freshman.

# Report on Senior Surveys for Academic Year 2019-2020

Survey of Undergraduate Degree Applications for

Aug 2019, Dec 2019 & May 2020 Graduation Dates

Results for Industrial and Operations Engineering (IOE)

**29. Overall, what aspects of your experience in the College of Engineering have you found to be MOST VALUABLE and LEAST VALUABLE? Please be specific. Share any other comments you would like to make, such as recommendations for specific changes, comments about quality of life as a CoE student, or descriptions of significant challenges you faced.**

The career resources, like the ENGenius website and Career Fair, were the most valuable. I also really appreciated the ENGR 100 course I took as a freshman to help me decide on a major.

The COE obviously offers a world-class education and I'm very happy to soon be able to count myself among those graduates. However, I'm extremely dissatisfied with many of my experiences at U-M. Most of my dissatisfaction revolves around money. To be clear, I grew up solidly middle-class, but my parents never saved enough to provide as much support as I needed through college. I ended up in the "middle-area" where they'd earned enough that I didn't qualify for need-based financial-aid for most of my time in school, but they couldn't be reasonably expected to support me as much. As such, I had to work constantly through school. In addition to summer internships, I worked as maintenance worker, in restaurants, as an RA, and whatever other odd-jobs I could scrounge up. The community in the COE, faculty in particular, managed to be astoundingly unwilling to understand what it's like to work 20+ hours a week for the majority of school. I had one faculty member tell me he couldn't make an exception related to work because "many students work and plan their schedules around this". That excuse was frankly crap. Most students DO NOT work while they're taking classes in the COE, and if they do it's only to earn spending money. I've worked to support all of my living costs throughout school. I wish the College, and the University as a whole had some recognition that not every student here has parents who make boatloads of money, and we NEED HELP. Not many of my friends in the COE have a similar situation to me, but those who are have also struggled mightily academically. I KNOW that I could have done significantly better in school if I wasn't constantly short on sleep from working all the time and stressed by constant financial problems. My parents certainly have a hand in this for not saving properly, but the college should've provided more support, and faculty should be expected to understand that we're not all rich. I can't describe how angry it makes me that I probably will never have the chance to get a PhD in engineering or the like because my undergrad GPA is horrible, mostly for reasons outside of my control. Mental health in the COE is a serious issue and it's still largely ignored. Most students are under constant pressure and stress to be perfect students, whether they've created that stress internally or get it from outside sources. Faculty put extremely intense demands on students and don't recognize what it does to our mental health. They don't seem to realize that most of us have major commitments beyond our classes. I'm close with a particular faculty member who was stunned to see how hard their son worked upon entering the COE. I wish the faculty here had a better understanding of that and I hope the College can find a way to better aid students in finding the balance between academic success, mental health, and having some darn free-time. I think that has to start with faculty and the college realizing the workload expected here is just too much for most students to handle. I do believe my BSE will set me up for a great career, but my college experience has been far from great and I'd have a hard time encouraging anyone to attend the COE unless they have the insulation of family money.

There were a lot of classes where I basically taught myself the material. Also any class that requires you to buy a textbook and never use it OR requires you to buy an access code just to do homework is a joke.

Value CoE - Engineering mindset and data analysis tools taught  
Non-Value CoE - Career guidance, especially outside engineering career fields