Rutgers Mechanical and Aerospace Engineering

2020-2021 Senior Design Questionnaire

Junior Class

Survey contacted by the MAE Undergraduate Office
March 28-April 4, 2020
Dear ME and AE students,

This survey is created to help us to structure the senior design process and organize it in a way that it will be helpful and more effective for student teams, and for the MAE department. It will help us to better identify your strengths and areas where collaborations would be most fruitful. Also, it will aid in identifying project design complexity, material and manufacturing requirements, required man and machining hours for each project, and eventually for all projects together. Your answers will only be shared with the MAE faculty and staff involved on your next-year Senior Design experience.

Thank you for your response.
Out of 211 students 148 have not formed teams as of 4/9/2020 and 71 of total students would like to be assigned to a team.
In terms of the Senior Design project, what are the areas of most interest to you? - select 2 -

211 responses

- Aerospace: 128 (60.7%)
- Robotics: 116 (55%)
- System Control: 58 (27.5%)
- Advanced Materials: 39 (18.5%)
- Competition projects: 46 (21.8%)
- Linkages, Bicycle related projects: 1 (0.5%)
- Heat Transfer / Fluid Dynamics: 1 (0.5%)
- Assembly: 1 (0.5%)
- Automobiles: 1 (0.5%)
- CNC manufacturing: 1 (0.5%)
- Energy efficiency/ renewable energy: 80 (37.9%)
- nothing that involves coding: 1 (0.5%)
<table>
<thead>
<tr>
<th>Stage of the Project</th>
<th>Number of Responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proof of concept, preliminary CAD design</td>
<td>140</td>
<td>66.4%</td>
</tr>
<tr>
<td>Creating foundation of technical design, initial prototyping, first assemblies</td>
<td>120</td>
<td>56.9%</td>
</tr>
<tr>
<td>Light manufacturing and prototyping (3D...)</td>
<td>128</td>
<td>60.7%</td>
</tr>
<tr>
<td>Machining (aluminum, steel, drilling, cutting, milling etc.)</td>
<td>110</td>
<td>52.1%</td>
</tr>
<tr>
<td>Final testing and assemblies, manuals and</td>
<td>71</td>
<td>33.6%</td>
</tr>
<tr>
<td>Overall project management</td>
<td>60</td>
<td>28.4%</td>
</tr>
<tr>
<td>Laying foundation of technical design, ...</td>
<td>1</td>
<td>0.5%</td>
</tr>
</tbody>
</table>
What project management tools and methods are you familiar with? (Do not worry if you don't, this will be part of the class)

211 responses

- Kanban method: 6 (2.8%)
- Lean project management: 18 (8.5%)
- Scrum method: 6 (2.8%)
- Paretto charts: 8 (3.8%)
- PERT method: 7 (3.3%)
- I don't have any experience with project...: 177 (83.9%)
1. Creating preliminary CAD designs, final parts and functional assembly models
211 responses

1 = beginner
4 = expert

1 2 3 4
7 (3.3%) 47 (22.3%) 118 (55.9%) 39 (18.5%)
Describe your expertise in the fields:

3. Very important! Electronic controller boards, sensors, electric motors, power supply (AC/DC)
211 responses

1=have not used them before
6=extensive knowledge

4. Light manufacturing (plastic, wood etc.) and basic-hands on experience (basic tools)
211 responses

1=no experience
5=expert
Describe your expertise in the fields:

5. Metal manufacturing, heavy machinery, CNC, special tools
211 responses

- 1=no experience
- 5=extensive experience

- 76 (36%)
- 74 (35.1%)
- 34 (16.1%)
- 17 (8.1%)
- 10 (4.7%)

6. Design of experiments, testing, manuals, documentation, presentations
211 responses

- 1=no experience
- 5=extensive experience

- 26 (12.3%)
- 55 (26.1%)
- 70 (33.2%)
- 48 (22.7%)
- 12 (5.7%)
Will you be interested (and have enough free time) to get more involved in MAE manufacturing and prototyping activities?

211 responses

- I don't have time: 10 (4.7%)
- Probably not: 25 (11.8%)
- I am considering it: 92 (43.6%)
- Yes, I am interested: 84 (39.8%)
- Definitely: 21 (10%)
- Yes I am interested: 1 (0.5%)
Will you be willing to participate in accelerated machine shop training, if available, in August?

210 responses

- Yes: 85.7%
- No: 14.3%