Developing a Winning Notebook

Bison BEST
Kick-Off Session
2014
The competition is comprised of two segments

0  Robotics Competition

0  The BEST Award (optional)

Note: The Project Engineering Notebook is required along with the robot for the robot competition
BEST Award

All teams are eligible for the BEST Award

Judging is based on five criteria (100 points possible)

0 Project Engineering Notebook (30 points)
0 Marketing Presentation (25 points)
0 Team Exhibit and Interviews (20 points)
0 Spirit and Sportsmanship (10 points)
0 Robot Performance (15 points)
Purpose

Tool for documenting the process used to design, build, and test the robot
Guidelines

- Standard 3-ring binder with 2” max rings
- Binder must identify the school, team name, teacher contact, and team number
- 30 Typed, single-sided pages or less
- Title & Table of contents page not included in count
- Double-spaced
  - Single spacing acceptable in tables and outlines
- 1” margins
- 8.5” x 11” Standard paper
- Times New Roman Font (preferred)
- 12 point font
Notebook Due Dates

NDSU Bison BEST

- Due by 10 AM on Friday, October 31st
- You may bring it to the designated area at the Check-In table or mailed ahead of time to:
  
  NDSU College of Engineering  
  NDSU Dept. 2450  
  Engineering Administration Room 210  
  P.O. Box 6050  
  Fargo, ND 58108-6050
<table>
<thead>
<tr>
<th>Purpose: To document the process used to design, build, and test the robot (30 Points)</th>
<th>Possible Points</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DESIGN PROCESS (15 Points)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Implementation of the Engineering Design Process Evidence that the engineering process was effectively used.</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Brainstorming Approaches How well organized and productive was the brainstorming approach used and documented</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Analytical Evaluation of Design Alternatives Use of analytical and mathematical skills in deciding upon and implementing design alternatives</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Offensive and Defensive Evaluation Analysis of gaming strategies and design elements to achieve goals</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Score Sheets

<table>
<thead>
<tr>
<th>• Safety</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence that safety training occurred and safe practices were followed to prevent students’ misuse of tools and other devices/equipment that may result in personal injury or damage to property</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>• Support Documentation</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAD/other drawings, photos, team organization, meeting minutes, test results, etc. that support the main document</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
</tr>
</tbody>
</table>

### RESEARCH PAPER (4 Points)

| • Correlation between game and how the science/technology is being used at a company/industry/research lab in the team’s state or region | 10 |
| Comments:                                                                |    |

| • Any related information of game theme, such as history, famous inventor(s), or major milestones. | 10 |
| Comments:                                                                |    |

| • Creativity in linking game theme to appropriately related science content | 10 |
| Comments:                                                                |    |
# Score Sheets

**OVERALL QUALITY AND COMPLETENESS OF NOTEBOOK (11 Points)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of completed Team Demographics Form</td>
<td>20</td>
</tr>
<tr>
<td>Organization and appearance</td>
<td>30</td>
</tr>
<tr>
<td>Table of contents, summary, page numbers, discussion of evaluation points, linkage to appendices.</td>
<td></td>
</tr>
</tbody>
</table>

**Adherence to specifications**
- Standard binder, business font no smaller than 12 pt., double-spaced (single spaced ok in tables and outlines), 30 one-sided page limit for main section, 20 double-sided page limit for appendices, 1” margins, required cover information.

<table>
<thead>
<tr>
<th>Quality of content</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well written descriptions, clear photo labels, lack of extraneous material, etc.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \div 10 )</td>
<td>( \div 10 )</td>
</tr>
<tr>
<td>Final score:</td>
<td>30</td>
</tr>
</tbody>
</table>
Notebook Evaluations

- Team Demographics Form (paper form)
  - **NEEDS** to be the first page of the Notebook
  - Failure to include this form will result in ineligibility to participate in the competition
- Implementation of the Engineering Design Process
- Research Paper
- Brainstorming Approaches
- Analytical Evaluation of Design Alternatives
- Offensive and Defensive Evaluation
- Safety
- Support Documentation
- Overall Quality and Completeness of Notebook
Engineering Design Process

1. Define the Problem
2. Research the Problem
3. Brainstorm Possible Solutions
4. Choose the Best Solution
5. Build a Model or Prototype
6. Test your Solution
7. Communicate your Solution
8. Redesign as Needed
Notebook Sections

- Research Paper
  - Description of how the current year’s game theme is related to current technological practices or scientific research (Refer to the A&J Part I for further clarification)
  - 2-5 pages (included in the 30)
  - Needs to be designated as a separate section
Supplemental Appendix

- Teams may include a supplemental appendix
- No more than 20 pages front and back (so really 40 pages)
- Include support documentation
  - Drawings or photos
  - Organization charts
  - Minutes of team meetings
  - Test results
• This material should directly support the process described in the primary document and **NOT** reflect activities related to community or promotional efforts, spirit development, or team-building.
Poor Notebooks

- Do not include every section in the guidelines
- Are not well organized
- Are not typed, or have poor formatting
- Do not document the entire process
- Are thrown together at the last minute
- Are a result of too much focus on robot performance and not enough on process
Tips For Success

• Assign a notebook manager
• Include everything that is required
  • No less, no more
• Use the project requirements as a checklist
• Take advantage of the appendix
  • This is a great place for miscellaneous evidence of the engineering process not included in the main paper
Tips For Success

• We have a lot of notebooks to judge, organization is key
  • Table of contents
  • Appendix
• Engineers like to see the process as much as the final result
  • Document all activities throughout the process
  • If you thought of it, document it
• Use the notebook as a working document
Questions?