BEST

Awards & Judging Project Notebook

LIPSCOMB UNIVERSITY | RAYMOND B. JONES COLLEGE OF ENGINEERING

Highest Awards

- Competition Award – 1st, 2nd, 3rd, & 4th
- BEST Award – 1st, 2nd, & 3rd
  - Project Notebook – 30%
  - Marketing Presentation – 25%
  - Team Exhibit & Interviews – 20%
  - Spirit & Sportsmanship – 10%
  - Robot Performance – 15%
- Bonus: Notebook scores determines which 4 teams earn a chance for the “wildcard” slot and go on to semi-final round!

BEST Award Categories

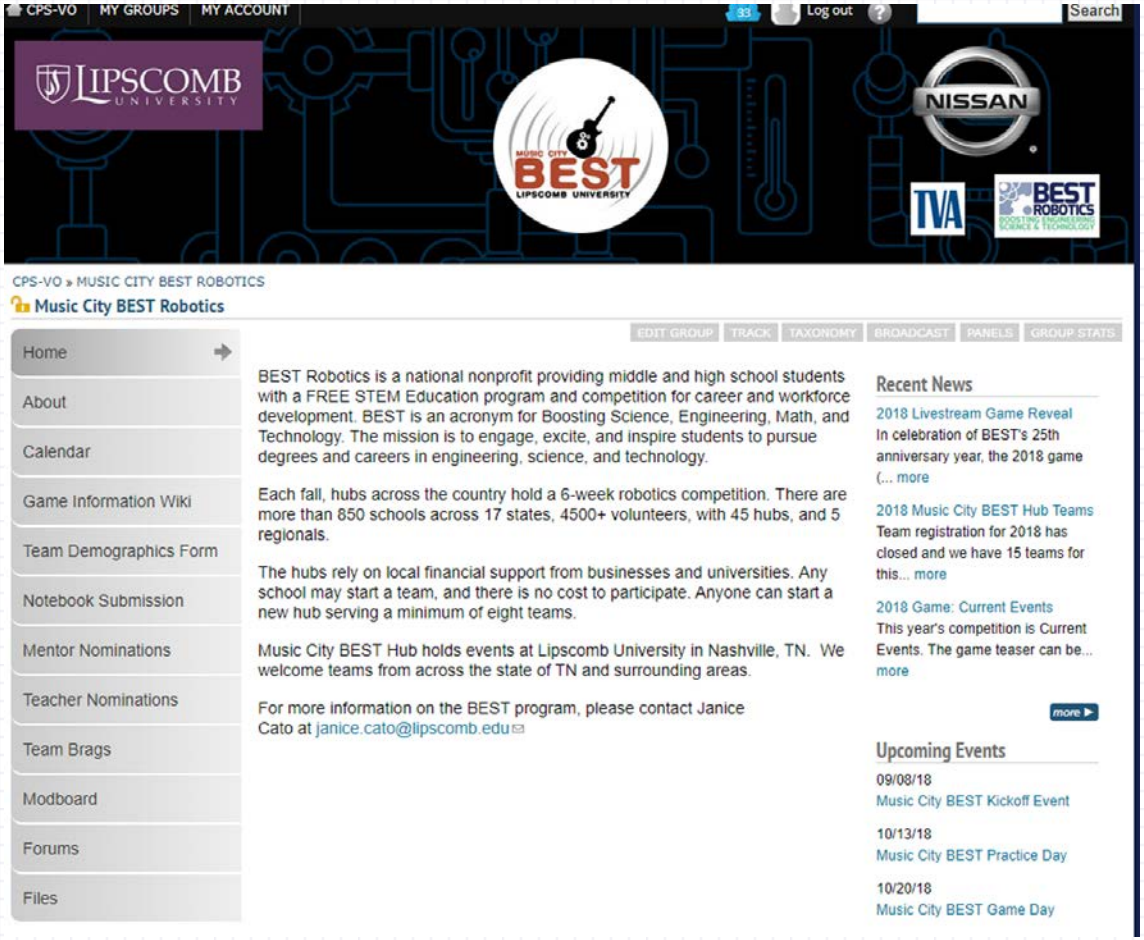
First Place Awarded for:

- Project Notebook
- Marketing Presentation
- Team Exhibit and Interviews
- Spirit and Sportsmanship

Deadline and Delivery

- All teams are required to submit an Engineering notebook
- Notebooks are due on October 16th
  - **no later than 4 pm**
- Teams will upload to www.musiccitybest.org
  - Alternate address: https://cps-vo.org/group/MCBEST
  - Deliver the notebook in PDF format
  - Follow Directions
- Filename: ###-Team or School Name-Notebook.pdf, where ### is the team number

musiccitybest.org



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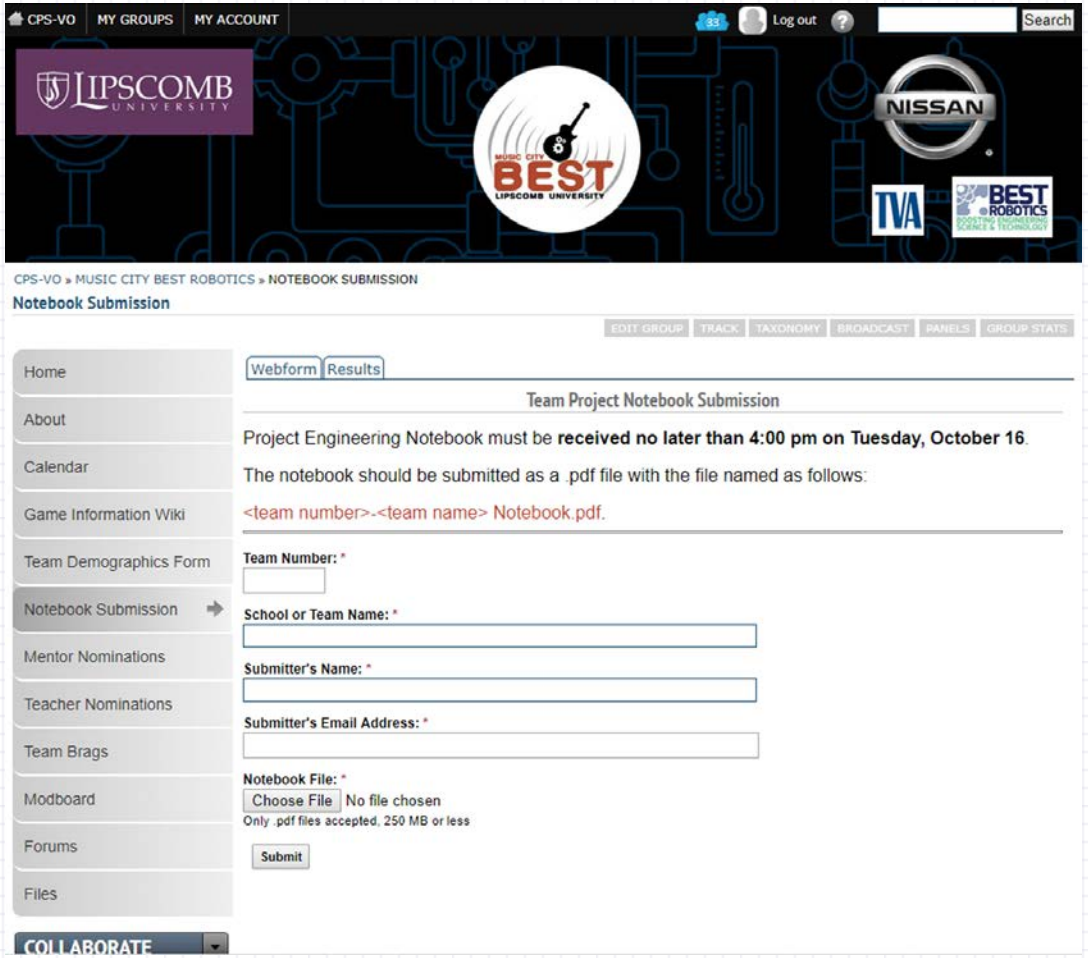
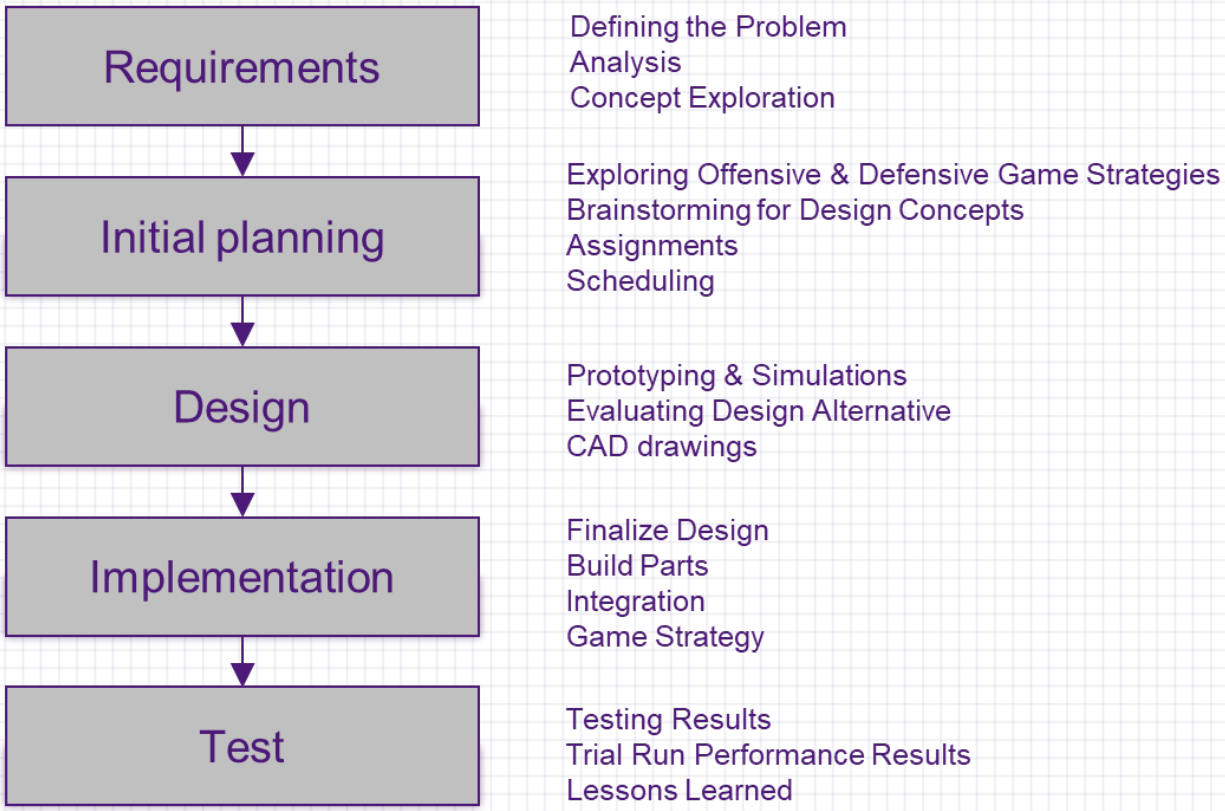
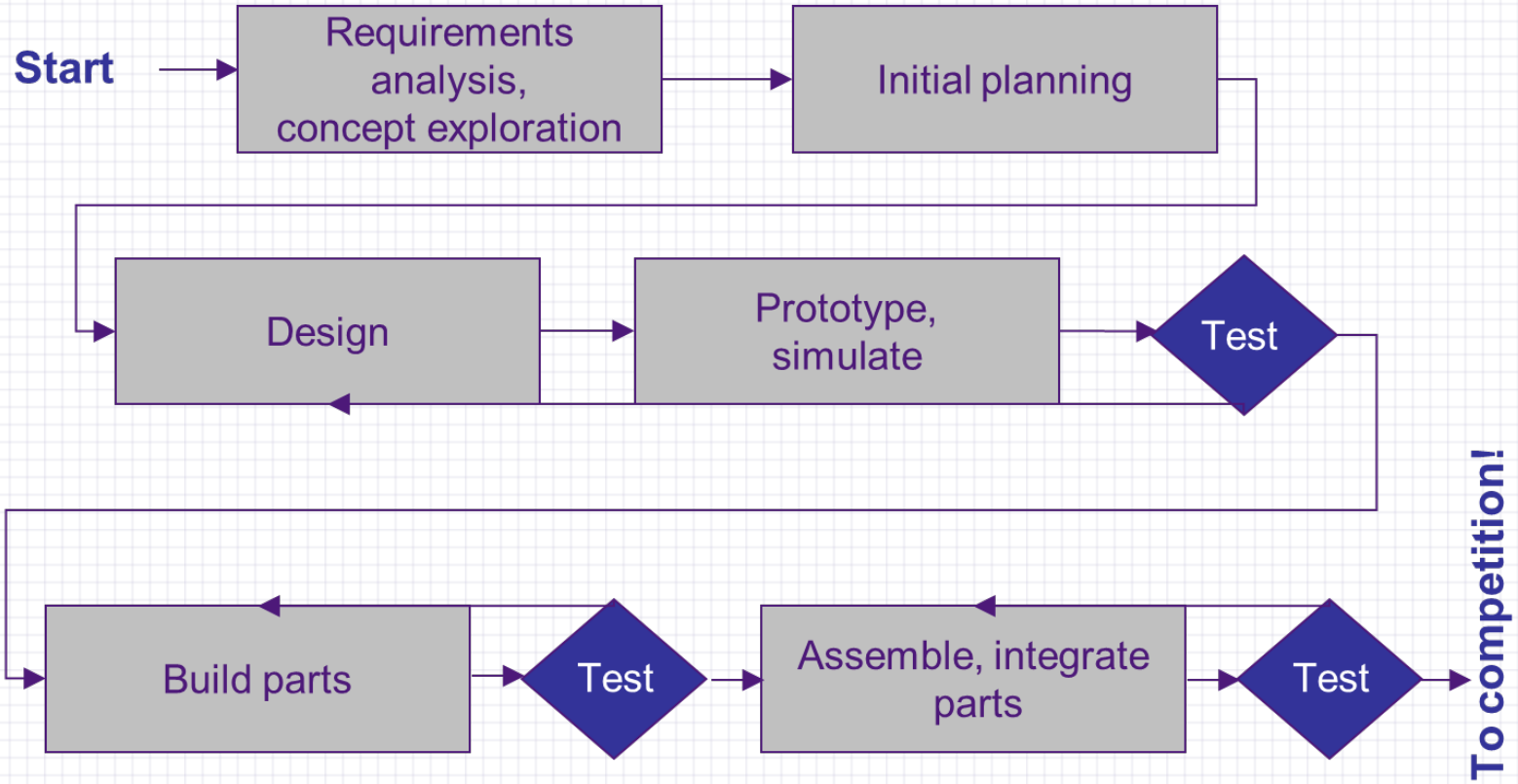


Engineering Design Process Overview



Engineering Design Process Flow Chart



Project Notebook

- Describes how the team designed, built, and tested the robot
- Provides evidence of how the Engineering Design Process was followed
- Demonstrates that safe practices were followed
- Explains the software design and verification process
- Includes a Research Paper – 2 to 5 Pages

Getting Started: Create a Notebook Team

- Identify the notebook development team
  - This shouldn't be a one person effort!
- Leaders
  - Notebook Editor – notebook planning, writer coordination, writing, editing, page design, assembly
  - Secretary – photos, scanning brainstorming sketches, activity logs (team activities, decisions, accomplishments), demographics
- All robotics team members should play some role
  - Not everyone will write the notebook, but everyone should contribute information

Notebook Editor

- Specify the word processing program to be used
- Establish a deadline for all submissions
- Determine the notebook style design
  - Writers should not be concerned about formats, spacing, margins, etc.
- It is easier for the Editor if each writer simply provides text
  - Editor can easily take care of the formats, spacing, margins, etc. after all the text is assembled into one file
- Make sure each student writing a section understands what is included and what should NOT be included
- Refer to the Awards & Judging Policies for format specifications

Be Sure to Plan Ahead!

- Have an initial plan and schedule
  - What is needed?
  - Who is going to do what, when?
  - What do you need to do it?
  - How are you going to do it?
  - How long will it take?
  - How will I know when I'm there?
- Think about the audience
- Create an outline
- Organize your information
- Decide what graphics you need for each section
- Finalize assignments and schedule

Pictures & Sketches

- Pictures and sketches are a vital part of the project notebook
- Secretary responsibilities
  - Accumulating, sorting, and filing pictures
  - Scanning brainstorming sketches into electronic files
- Each writer should have access to them and can insert them into the document as needed
  - Otherwise, the Editor will have to edit the submissions and choose the appropriate pictures and sketches to be inserted

Notebook Specifications

- Number of Pages: 35 pages or less
  - Note that the Title and Table of Contents pages will not be counted as part of the 35 pages
- Cover sheet or title page must identify the school, team name, teacher contact, and team number
- Page Format: Standard, 8 ½" x 11" paper, double-spaced, 1" margins
- Font: Times New Roman (preferred) or similar business-style font no smaller than 12 point
- Single-spacing is acceptable in tables and outlines

Notebook Specifications (cont.)

- Research Paper: include a description of how the current year's game theme is related to current technological practices or scientific research
  - Minimum of 2 pages, maximum of 5 pages
  - Included in the 35 page count
- Teams may include a supplemental appendix of no more than 40 pages in length
  - May include support documentation such as drawings, photos, organization charts, minutes of team meetings, test results, etc.
  - 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

Think About Your Page Layout

- Keep it simple!
- Don't use too many fonts or colors!
  - Max 4 colors per page
  - Max 3 fonts – use bold and italic sparingly
- Don't use quotes and underlining
- Use white space, avoid clutter
- *BE CONSISTENT!*
  - If multiple people are creating different sections, make sure they all come together as one single book
- Omit needless words
- Writing should be concise and clear
- Use a stylebook for grammar, punctuation, abbreviation, capitalization, etc.

Try to Omit Needless Words

Avoid	Use
in the amount of	for
for the purpose of	for
in reference to	about
in order to	to
in order that	to
if it should turn out that	if
with the result that	so
question as to whether	whether
if at all possible	if possible
in most cases	usually
at the present time	now
currently	now
a number of	some, several
a distance of 2 yards	2 yards
totally demolished	demolished
alternate choices	choices

Writing Style

- Do not use “I” and “we,” always use third person such as:
  - The base design team developed …
  - The arm design team built a prototype of …
  - The BEST Robotics team decided to use a strategy of …
- Avoid passive voice
  - “The robot was built by the students.” (passive) vs “The students built the robot.” (active)
- Use a personal, conversational tone
  - Make sure it sounds natural when read aloud
  - Ask another person to read and provide inputs
- This is not a creative writing assignment
  - It must maintain a technical focus throughout by being well organized, unambiguous, and “to-the-point”

More Writing Tips

- Focus on what is important and put that first
- ALL content in the Project Notebook must support the design process, no extraneous material
  - ***Things like marketing, outreach, tee-shirt design, etc should not be included anywhere in the Notebook.***
- Use lists, tables and figures effectively
- No brain dumps! Follow your outline
- Run spell checker, but also have someone proofread
  - Spell checkers don't catch misspellings that are legitimate words
- Number your pages

Don’t Forget Graphics!

- Keep them clean and simple
  - Don’t use too many colors and heavy lines
  - Clean up hand drawn figures and hand written notes
- Focus on what is important
  - Get photos of team members using tools, brainstorming, CADs to support your design
  - If a photo/chart/etc. does not have a caption and it is not clear how it is used in the text, then it should not be there.
- Label every graphic and reference it somewhere in the text
- Check the spelling in your graphics

Notebook Requirements
(From the Score Sheet)

- Research Paper (40 pts of 300 total)
  - 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 pts max)
  - Any related information of game theme, such as history, famous inventor(s), or major milestones (5 pts max)
  - Analysis of game theme/problem & related technology's impact on the human experience, our needs, adaptations and progress with solutions (5 pts max)
  - Creativity in linking game theme to appropriately related science content (10 pts max)
  - Proper use of grammar and composition throughout paper, citations of sources used to gather information for paper, stayed within 2-5 page limit (10 pts max)

Notebook Requirements
(From the Score Sheet)

Design Process (170 pts of 300 total)

- Implementation of the Engineering Design Process (25 pts max)
  - Evidence that the engineering process was effectively used
- Brainstorming Approaches (25 pts max)
  - How well organized and productive was the brainstorming approach? How well was the brainstorming approach documented?
- Analytical evaluation of design alternatives (25 pts max)
  - Use of analytical and mathematical skills in deciding upon and implementing design alternatives
- Offensive and defensive evaluation (25 pts max)
  - Analysis of gaming strategies and design elements to achieve goals

Notebook Requirements
(From the Score Sheet)

Design Process (cont.)

Software Design and Simulation (25 pts max)

- Evidence of custom software design vs default program;
- Demonstration of software design process;
- Evidence of design/verification methods and tools (e.g., Simulink) utilized in the design process;
- Consideration of good software design practices such as comments, naming conventions, design simplicity, modularity, portability, etc.

Notebook Requirements
(From the Score Sheet)

Design Process (cont.)

- Safety (20 pts max)
  - 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
- Support Documentation (25 pts max)
  - CAD/other drawings, photos, team organization, meeting minutes, test results, etc. that support the main document (max 20 double-sided pages)

Notebook Requirements
(From the Score Sheet)

- Overall Quality and Completeness (90 pts of 300 total)
  - Organization and appearance: Table of contents, summary, page numbers, discussion of evaluation points, linkage to appendices (30 pts max)
  - Adherence to specifications (30 pts max)
    - ~~Standard binder~~
    - Business font no smaller than 12 pt., double-spaced (single spaced ok in tables and outlines)
    - 1" margins
    - 35 one-sided page limit for main section, 20 double-sided page limit for appendices
    - Required cover information (school team name, teacher contact information, and team number) Quality of content: Well written descriptions, clear photo labels, lack of extraneous material, etc. (30 pts max)

Notebook Outline

- Executive Summary
- Engineering Design Process
  - Defining the Problem
  - Exploring Offensive & Defensive Game Strategies
  - Brainstorming for Design Concepts
  - Prototyping, Testing, & Evaluating Design Alternatives
  - Final Design and Game Strategy
  - Trial Run Performance Results
- Safety
- Software Design, Verification, and Release Process
- Research Paper

Details for this outline are contained in the Music City BEST Team Handbook

Notebook Outline

- Appendix
  - Members and Mentors
  - Team Organization Charts
  - Accomplishments & Decisions Log
  - Electronics and Controls Layout
  - Robot Design Details
  - CAD Drawings
  - Trial Run Results

Details for this outline are contained in the Music City BEST Team Handbook

Pro Tips to Maximize Your Notebook Score

- Have at least one flow chart! This is a process notebook, so show your process
- Organize your notebook to follow your process
- Include references to supplemental material
- Make sure captions for figures and tables are clear

Pro Tips to Maximize Your Notebook Score (cont.)

Be sure your notebook explains:

- Your team's strategy and goals in the game
- Brainstorming results
- The robot requirements needed to meet your strategy and goals
- Alternate ideas
- How you will know when you have met your goals?
- Team schedule and assignments

Pro Tips to Maximize Your Notebook Score (cont.)

Does the notebook describe:

- How the team determined the design?
- Decisions that affected how the robot was built?
- Mathematical and physics analysis, equations and formulas used?
- Analysis of game strategies?
- Impact of strategy decisions on the design?
- Were any solutions particularly creative?

Pro Tips to Maximize Your Notebook Score (cont.)

Does the notebook include:

- Test results of all robot design options?
- Analysis of both successes and failures?
- What your team learned that might help with future competitions?

Does supplemental documentation:

- Directly support the notebook content (engineering process)?
- Have a cross-reference somewhere in the main body of the notebook?
- Meet the page-count limit?