JULY 12-13

REC Foundation Coach Summit 2022
Join us for training and discussions so that you can learn more about us, and we can learn how to better support you!

STRATEGY DICTATED DESIGN

BRANDI BOLINGER & DAN TROY
BEFORE WE BEGIN

BEST PRACTICES

This is for YOU - the Coaches. Please ask questions when you have them.

- Mute Yourself
- Utilize the Chat
- Cameras Optional
- Be Respectful
Brandi Bolinger
Team Engagement Manager
MI, IL, WI, MN, ND, SD, IA, AND NE

Robotics Coach, Mentor, Volunteer, and Event Partner
Over 16 Years of Experience Coaching Competitive Robotics
Co-Head Mentor for Team 2337 - The EngiNERDs
VRC, VIQ Camps, FLL, FTC, FRC, OCCRA
Certified Referee, Event Partner, and Judge

Born and Raised in Mid-Michigan
Specializing in Anything “Team” Related

Email: brandi_bolinger@roboticseducation.org

Dan Troy
Team Engagement Manager
CT, DC, DE, MA, MD, NH, NJ, NY, PA, RI AND VT

Over 16 years of Competitive robotics experience
VRC, VIQC, VEXU, FLL, Sea Perch and FRC
Certified Educator in VEX GO, VEX IQ, VEX V5,
and CS with VEXcode VR.
Certified Volunteer in Head Referee (VIQC/VRC), Judge, and Event Partner
Favorite Role Emcee/Play by Play

Born and raised in Philadelphia

Email: dan_troy@roboticseducation.org
CORE PRINCIPLES: STUDENT-CENTERED

Student-Centered Learning
Students are actively involved in learning opportunities to increase their knowledge and skills in the engineering design process, mechanical design, programming and teamwork under the guidance of adult mentorship.

Student-Centered Application
Students have ownership on how their robot is designed, built, programmed, and utilized in match play with other teams and Robot Skills matches.

Student Centered Policy
<table>
<thead>
<tr>
<th><strong>WE ARE NOT HERE TO:</strong></th>
<th><strong>THE MAIN GOALS ARE TO:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DISCUSS GAME CALLS</strong></td>
<td><strong>TEACH CRITICAL THINKING</strong></td>
</tr>
<tr>
<td>Your Head Referee will make that decision based on the situation.</td>
<td>Use your role as a teacher or coach to guide students through the learning process.</td>
</tr>
<tr>
<td><strong>DICTATE ROBOT DESIGN</strong></td>
<td><strong>OFFER NEW PERSPECTIVES</strong></td>
</tr>
<tr>
<td>Each Team’s goals and measurement of success SHOULD be different.</td>
<td>What works for one, may not work for another. Steal from the best, and design the rest.</td>
</tr>
<tr>
<td><strong>BREAK THE GAME</strong></td>
<td><strong>ENCOURAGE NEW IDEAS</strong></td>
</tr>
<tr>
<td>Read the rules with the intention of following them, not breaking them.</td>
<td>Sometimes doing a little math can help you identify a strategy that you’d never considered before.</td>
</tr>
</tbody>
</table>
“We are going to relentlessly chase perfection, knowing full well we will not catch it, because nothing is perfect.

But we are going to relentlessly chase it, because in the process we will catch excellence”.

- Vince Lombardi
WHAT IS A STRATEGY DICTATED DESIGN?

- **UNDERSTAND**: The Game Rules as they Are written
- **IDENTIFY**: All possible scoring and de-scoring opportunities
- **Determine**: Your Overall Strategic Goal
- **Prioritize**: Each Scoring Opportunity Based on your Resources
- **Calculate**: Max Score and Points Per Second
- **Evaluate**: Your Internal and External Resources
- **Implement**: Your Goals, referring back to your Strategic Priorities
- **Prioritize**: Your Overall Strategic Goal
ASSESSING YOUR RESOURCES

TIME
- When is your competition?
- How often do you meet?
- How long are your meetings?

TECHNOLOGY ACCESS
- Devices per Person
- Internet - at home and robotics
- Familiarity with hardware & software

WORK FORCE
- How many Students?
- How many dedicated Mentors?
- What is your Teacher & Staff Support?
- How much Parent involvement?

MATERIALS SUPPLY
- Longer Shipping & Lead Times
- Product Availability
- Discontinuation of services
- Available Stockpile of Goods

BUDGET
- Has your Sponsorship changed?
- Accounting for increased prices?
- Counting on Individual Contributions?

KNOWLEDGE & SKILLS
- Disrupt in Transfer of Knowledge
- Mentor and Student Experience
- Machining, fabricating, Safety

EACH SEASON IS GOING TO LOOK DIFFERENT

ROBOTICS EDUCATION & COMPETITION FOUNDATION
Inspiring students, one robot at a time.

COACH SUMMIT 2022
What do the rules say?
Read the rules in a logical order and take notes for visual learners.

What are you ALLOWED to do?
Some things are EXPLICITLY called out as allowable actions.

What are you PROHIBITED from doing?
Some things are EXPLICITLY called out as prohibited actions.

What don’t the rules say?
Don’t lawyer the rules! But, if it doesn’t say you CAN’T, maybe you can?

Strategic Moves & Maneuvers
Game plays are NOT going to be called out - it’s up to you to develop them.

Maximum Benefit Opportunities
Is there a “flow” that you can achieve to get the most out of each match?
IDENTIFYING GAME PIECES AND TIMING

Types of Game Pieces
One or multiple types?
Different or same values?
How many of each type?

Access to Game Pieces
What are the starting locations?
Physical access restrictions?
Human-load vs on field?
Are there possession limits?
Can game pieces be reintroduced?

Match Breakdown
Autonomous bonus or Win Point?
End Game bonus or Win Point?
Access time limitations?
Compounding Bonuses?
### Imaginary Game Example with Finite Scoring

<table>
<thead>
<tr>
<th>Description</th>
<th>Accessed During</th>
<th>Quantity Available</th>
<th>Points per Action</th>
<th>Calculated Max Score</th>
<th>Contribution Percent of Total Max Score</th>
<th>Estimated Seconds per Action</th>
<th>Points Per Second</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement Bonus</td>
<td>Autonomous</td>
<td>1*</td>
<td>5</td>
<td>5</td>
<td>4%</td>
<td>2</td>
<td>5 ÷ 2 = 2.50</td>
</tr>
<tr>
<td>Autonomous Bonus</td>
<td>Autonomous</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td>8%</td>
<td>15</td>
<td>10 ÷ 15 = 0.67</td>
</tr>
<tr>
<td>Game Element A Scored</td>
<td>Drive Control</td>
<td>20</td>
<td>1</td>
<td>20</td>
<td>17%</td>
<td>8</td>
<td>1 ÷ 8 = 0.13</td>
</tr>
<tr>
<td>Game Element B Scored</td>
<td>Driver Control</td>
<td>2</td>
<td>15</td>
<td>30</td>
<td>25%</td>
<td>20</td>
<td>15 ÷ 20 = 0.75</td>
</tr>
<tr>
<td>Zone Possession Bonus</td>
<td>End Game</td>
<td>3</td>
<td>5</td>
<td>15</td>
<td>13%</td>
<td>5</td>
<td>5 ÷ 5 = 1.00</td>
</tr>
<tr>
<td>End Game Bonus</td>
<td>End Game</td>
<td>1*</td>
<td>40</td>
<td>40</td>
<td>33%</td>
<td>10</td>
<td>40 ÷ 10 = 4.00</td>
</tr>
<tr>
<td><strong>TOTAL PER ROBOT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>120</td>
</tr>
</tbody>
</table>

Autonomous = 15 seconds
Game = 15 seconds*
Driver Control = 105 seconds
End
FOCUS ON WHAT INSTEAD OF HOW

THINK ABOUT...
- What can a robot do?
- Words that generically describe a mechanism or function
- How to break down each individual task into smaller tasks
- What belongs together, and what are stand-alone tasks

THINK ABOUT USING:
- Shoot
- Score
- Manipulate or Obtain

INSTEAD OF:
DETERMINE YOUR OVERALL STRATEGIES

STEPS FOR STUDENT-CENTERED SUCCESS:

- Decide ahead of time - digital or physical note-taking
- Designate a Scribe
- Begin leading the discussion to get the ball rolling
- Ask Students Open-Ended questions
- Have students populate the notes

- Write everything down, post it, and organize it later
- Keep the Students organized and on-task
- Don’t give them the answers!
- If something is missing, guide them toward the answer
- Assist with “what not how” phrasing
REORGANIZING YOUR PRIORITIES

QUESTIONS TO ASK YOUR TEAM:

- Realistically, what does our time together allow us to build or accomplish?
- How will our budget affect our abilities?
- Do we have access to the physical resources to make/build/program this?
- Do we already have, or can we find people to help?
- Can we work in parallel, or do we need to work in series?
DETERMINING YOUR MATCH PLAY

**THINGS TO CONSIDER:**
- Are there designated scoring timeframes?
- How many times can you do the action?
- How many of each game piece are there?
- How many of each field element are there?
- What is your travel time?
- Can your efforts be unscored?
- Can you perform more than one action at a time?

**YOUR CONTRIBUTION:**
- What is the maximum score of each match?
- What percentage of the max points can you score?
- How many points per second are you scoring?
- What is your contingency plan?
- How are you going to coordinate with you Alliance Partners each match?
- Have you calculated your *actual* contribution?

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**Autonomous**
- Action Goal
- Point Goal
- Set up for success

**First 45 seconds**
- Action Goal
- Point Goal
- Contingency Plan

**Next 45 seconds**
- Action Goal
- Point Goal
- Set up for success

**End Game**
- Action Goal
- Point Goal
- Contingency Plan
TIPS FOR IMPLEMENTING SUCCESS

ENCOURAGE YOUR STUDENTS TO:

- Read the Game Manual- paying close attention to the red boxes
- Read the Game Manual AGAIN
- Evaluate your Team’s resources
- Define Success for each individual and Team
- Check for Game Manual updates
- Read the Game Manual AGAIN
- Set and prioritize their strategic objectives
- Keep the priorities posted in a public place
- Refer back to priorities often
- Iterate, ITERATE, ITERATE!
- Commit to Continuous Improvement!
CATCHING EXCELLENCE

WHAT DOES SUCCESS LOOK LIKE?

ASK YOURSELF AND YOUR ORGANIZATION: “HOW CAN I CONTRIBUTE TO THE SUCCESS OF MY TEAM?”

ROLE OF THE STUDENTS:
- Set goals and measures of success
- Work toward achieving excellence
- Be the driving force of progress
- Build the Robot, document the process

ROLE OF THE COACHES AND MENTORS:
- Link the past and present
- Encourage Students
- Assist and enlist help when needed
- Share knowledge and skills
- Manage documents and respect privacy
- Assess resources and plan accordingly
COMING UP NEXT

THE SECRETS OF BECOMING A BETTER COACH

3:00PM