

HS IET Robotics
Classroom

Teacher: Thank you for coming to class on time, everyone. As you know, we have our [inaudible 00:05] championship, which is our culminating event starting tomorrow for the next two days, Friday and Saturday. I just want to make sure that all of you are ready for competition. I know we've competed in several tournaments this year, and all of you have had great success. Learned a lot at tournaments. Trying to improve your robots and making it better for the subsequent event. What you folks need to do today is spend a lot of time ensuring that everything is working properly. I want to see all of you doing some testing, modifications to your robots. Make sure that your engineering and design notebook is up to speed and ready for competition. Does anybody have any questions before we start today? Any questions?

Okay. As usual we have our documentation team here. We have Student, Student and Student who's going to be filming as part of our documentation throughout the school year on all the different parts of our program. They will be filming you folks as well. No questions? If not, why don't you folks get started. Make sure that you guys are ready.

[00:02:00] Mentor is also here during this period. He's here to help you guys on any final programming challenges or issues you may have, and ensuring that what you want the robot to do will perform exactly how you want it. All right. Well, let's get to work. Make sure you folks check that design rubric now, because the design award qualifies you folks for the world championship.

Student, where's you guys' notebook? Let me see what you guys have so far. Hold it up higher, a little bit. Where do you see [inaudible 00:03:52]?

[00:04:00]

Students: That's an arch.

Teacher: I want to see how fast this thing is now. All right. You guys want to show me that?

Students: Sure.

Teacher: Okay. Are one of you guys going to test your robot to see how fast it is?

Students: We're going to do a [inaudible 00:05:11].

Teacher: What are you guys testing on? Working on?

Students: Autonomous.

Teacher: Autonomous? All right. Eli, I thought you were done already. You guys modifying something?

Students: Yeah. Wait, what?

Teacher: [00:06:00] What are you guys working on? Good. Are you going to ask Student to help you with that? Student, are you doing the timing thing also, to make sure that it's ... if it's too short, you make it go. What happens if you ... the shot is short, what do you end up doing? I'll leave these sheets up during ... I'll pass the sheet off dirty. Is it over a minute, under a minute, about a minute? Under a minute. You want to move it? Are you going to shoot it this way? Yeah, there you go, perfect. You can be filming that thing, but I need the panel here.

Can't hear you, Student, what was that?

Students: It's 1, 4 now.

Teacher: [00:08:00] How did he do with the 4? Student, make sure you get the shots of them shooting the ball so you can evaluate later. All I know is we can do it ... have you guys got a lot of immediate things, or no? Student, maybe after this you can help the night folks ... is this the only blue that we're on?

Students: Yeah.

Teacher: Okay.

Students: It has a tendency to overshoot sometimes.

Teacher: What are you adjusting now, Student?

Students: Speed.

Teacher: Okay, you're increasing it, right? Are you just picking numbers or ...

Students: [00:10:00] We're trying to put them a little over now because it's easier to find the dials back than go forward, so we just perch an ax for now if it happens.

Teacher: I can't hear you guys. What time is it? Okay. What are you doing right now? Did you guys put a calendar in your binders?

Students: Yes.

Teacher: [00:12:00] Aim it to the right. Once you dial it in, you're going to put all 4 in, right? Okay, good. How are you getting your position? I want to see the improvement. A 300 squirrel would be pretty ideal for skills. Think you can get there? Okay, good. Eli, at some point I'd like to see you guys on this, in the shot I see. All right, so you got your shot, you might put all 4 and see, you never need all 4 in autonomous. You said once and this would be the second time, right?

Students: Probably.

Teacher: Okay. Well, because you're behind the ... okay, so, Student, it's actually more power now, you can still do it. Ready? Go. Speed up, Student. What's wrong? What are you going to do next.

Students: I've got to go faster.

[00:14:00]

Teacher: You don't want to slow this down. Okay, so you want to keep the same firing rate but just feed it faster so then it shoots the ball out. Why don't we try that? Let's get all the balls back and feed it faster, much faster, Student. Also, Student is better at doing this. Student, why don't you run and fire that beam? Because they didn't make all their shots. I want to see it rolling. 90 percent radar of higher fields. You want a band for that? Really? Student, what happened when you shot all 4? Have you seen again?

Students: I forgot to download.

Teacher: Forget to download the code, why don't we download the code and then it should be better next time. If you feed it faster, there's a greater load on the robot, it should shoot more. Student, I think ... faster. Ready, set, go. Much better. How many did you miss?
[00:16:00] Please keep track, one more time, I want you to keep track. How much did you miss? Come on, 90 percent reminder, folks. The first ball went sideways, why did it do that? That might be a good thing, because if there's two bows in skills, you could actually make bow the one without the robot.

Students: I understand what you mean.

Teacher: How many are you guys trying ... you only have one of these? Okay, so make sure you have your 24. What is the 90 percent rate? Couldn't hear you. What is 90 percent off 24? 10 percent is 2.4, what is 24 minus 2.4? How many do you have to make in order to get full to 90 percent? Feeds, you can only mix two shots. Okay, so I want to see 22 shots go in. You ready? Download the code, Student. Okay, let's see it, let's make all 4. Okay, not bad, 3 out of 4. Let's make it 4 out of 4. I'm sorry?

Students: One day it's going to shoot all the way across, they've done some good work.

[00:18:00]

Teacher: Very good. This thing seems pretty fast. How many are going to be decided? 22? You're going to make all 24, be positive. Go. Faster. All right, I'm going to give you this. 1, 2, 3.

Students: 4, 5, 6.

Teacher: Okay, so you made 18. Then it was the ... because the beginning part, it wasn't shooting it. It is because it was all next to each other? Okay, so then don't put any of the robot when Danny starts your sequence, okay? We'll try it again. Okay, so how are you going to fix that? Okay, let's put the couple standoffs on. All right, Student, we're going to see

4 out of 4 now.

Students: We're seeing if we can because we had some extra time.

[00:20:00]

Teacher: You're missing the first 3 or 4. Now we want to make sure we get ... did you download the code for that?

Students: I'm not going to answer that with that being the case.

Teacher: Okay, so you didn't download it again.

Students: I'm not saying anything.

Teacher: Okay, good.

Students: I'm not saying anything.

Teacher: How are you going to make it autonomous?

Students: Should be 4. 3 to 4.

Teacher: 3 to 4? What should we shoot for?

Students: We'll shoot for 4.

Teacher: Exactly. In the finals match, when you get there, how much do you think you're going to have to be making in that finals match? The ideal alliance is 3 5 by an A, B and C. That may happen, you never know.

Students: What if they do?

Teacher: Did they say that? They told you that they're doing much better now?

Students: Yeah.

Teacher: You talked to them? Almost.

Students: I'm just going to ...

Teacher: What's up?

Students: If I add a second to it. I meant a millisecond.

[00:22:00]

Teacher: Give it a good one. Okay, try to get ... okay, so what ... what did you modify? Okay. Are

your batteries good? Why do you think that first one takes a while? Okay, so you restart the machine, then ...

Students: It's the first and the last. It might miss the first 2, but they ... it's the part that probably makes it quite fast.

Teacher: Do you think you have the visuals, I want to shoot all 24 on one side, all 24 on the other side and go out and grab more?

Students: Actually, the trend is 32, 32.

[00:24:00]

Teacher: You think you can shoot all of it and say that from the field?

Students: The thing is, for the match, they're asking you to do that.

Teacher: Right, because you have to get ...

Students: They push you on the field course fast ...

Teacher: Yeah. They're asking you to be able to shoot all 24 in 30 seconds. Wow. That's pretty good. How long were you thinking before? Over a minute, right? Now this is, what, 25 seconds, maybe?

Students: 15.

Teacher: 15 seconds. Let me time that, try it again. Those are in the game.

Students: Student, go.

Teacher: Your co-shots, because your power is really high, when you turn it around ... when you're not using all 6 motors ... that's good, so you're going to be making everyone's solutions, all right. You know that between the last tournament and now, you guys still have a ball there, those things. Very good. All right. Before I see you guys do that, I want to see if you can make that ... work. You guys are ready to go, Student? He's checking the batteries, okay. Okay, so you're going to try the 4 again. Okay, so in order to be successful this weekend, what are 3 things you've got to make sure works. Name one.

Students: Robot.

Teacher: Not the robot, that's everything. Be more specific, what are the 3 things you've got to make sure is working, folks? Autonomous, that's one, what else? Skills, and the third thing. Okay, well, a team needs its ... yes. Make sure that your front and 4 shots are working, right, because it's a different trajectory, different speed, make sure they're both working. Hang on, okay. You're telling me you're going to do this in 15 seconds.

[00:28:00] We'll find out. Hang on here. Hang on folks. All right, here we go. In 3, 2, 1, go. Okay,

start over again.

Students: Student, more? Student. Yeah, that's good. Why don't we just put the ... on it?

Teacher: Okay, you ready? Ready, set, go. 18 and a half seconds, still not bad, but you've still got to make all the shots. How many did you make? What about this one? You didn't want to shoot that one? Okay, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. You have roughly 16 in there, so you're making about 6 percent of those shots.

Students: Right.

Teacher: I'm just timing, making sure that it goes in, all right? Okay. On a full battery what? You want a full battery, is that what you're saying? Whether you're shooting in 18 and a half seconds or 25 seconds, of all that goes in, 25, what's the 7 seconds? You're still alive ...
[00:30:00] you guys are already going to run up walls, so go about ... what are you guys shooting on your ...? Okay, good. How are you luring your collar? What ability was it at before, and how much are you decreasing it by? 5 percent, okay, let's try that. Good. You're downloading it right now? You're downloading it?

Teacher: Are other teams using, do you think, smaller shooters? What about ... is it a team that has the world record [inaudible 00:31:38]. Okay, so after you're done, man ... it's a skills robot. They lost the tournament once. For skills you're doing ... yeah. Good, almost there. You didn't save those right now? Okay.
[00:32:00]

Students: I just hit one.

Teacher: I've got to ask you guys this. When you people put the PTO, the power take-off, whose idea was that? Who's the one that's engineering it and making that hard take-off?

Students: We looked at the other designs. We actually had a PTO before ...

Teacher: Text me, "Where are you?" The other one, what? The other one, you couldn't, right? Right, the one that you climb, the wheels could be moving. This engaged the whole drive. You could use this, even with the lifting pad.

Students: Move that from one side to the other side.

Teacher: All right, I see 4 out of 4 now, so what modification do you got to do to change the timing? Okay, so far so good. Okay, so you're shortening it so that it goes with more time and then it gets farther.
[00:34:00]

Students: Yeah, because there's a sweet spot on the switch where it wants to correct itself.

Teacher: Student, are we going to have this on our website?

Students: Is it up?

Teacher: Are you going to test one first, just test a couple? That one's still powerful.

Students: It's not ready yet.

Teacher: What are you guys going to do now? All right, so now you've just got to get to ... hopefully, the first one is an anomaly, right? Okay.

Students: It might help to try to plug in the battery.

Students: Oh my god.

Students: The battery should be plugged in.

Teacher: [00:36:00] I feel like you actually need [inaudible 35:58]. It hit a little better but it could probably be a little more. Make it more conduction. Do you think that the timing, change the timing, that's not the ... have you guys ever thought about just moving the robot or no?

Students: We have it all the way forward.

Teacher: That's the most you can go forward?

Students: Yeah, pretty much.

Teacher: Okay, so that's your guide. All right.

Students: First one should have just a type of weights.

Teacher: Okay, CT, where are we at? Okay, are you going to run it right now?

Students: Yes.

Teacher: It looks like it's aligned to both aspects.

Students: Because the ball goes a little left.

Teacher: The balls go left. Yeah, I can ... you see what, Abraham? What's happening? You guys position the robot to the right. Yeah, because it looks like it's not going to make it. Let's see it. Heads up. That looks a little crooked, try and get it, it's not even hitting the center of the mat.

Students: Did not work, I don't know why.

[00:38:00]

Teacher: 1, 2, 3, just one more. That's why we work on robots. Almost there. [Inaudible 00:38:01] Yeah, we've got about 25 more minutes. Here we go. 1, 2, 2 and a half, 3 again. I'm

sorry?

Students: A consistent 3.

Teacher: A consistent 3, but we want ... we want 5, we can't have 5.

Students: It's also loose and very ...

Teacher: You ready to try it again? Okay, A Team is ready to try it again, Student. That was pretty good, you got it in there perfectly. Guess what? Try it again. Keep going. How much did you reduce it this time? Quite a bit, okay. Too much. It's too much. No, give it 1 to 5. 20 percent, was that 20 percent more than the last one or from the original maths?

Students: Can I open this?

Teacher: Okay, so that's ... Okay, so we're getting there, folks, just got to make some more minor tweaks, as long as you understand what you have to change, then it should be good.

Students: It's downloading ...

Teacher: [Inaudible 41:43]

Students: Go Student, go!

Students: It went over anyway.

[00:42:00]

Teacher: All right, what is the reduction at now? 15 ... from the max? Okay, it was 25 from the max the last time, right? Okay. It should be perfect. 5 was too much, 25 too little. 15, all right. Let's see increased accuracy, folks. Okay, new battery. 1, 2, 2 and 3. You're really good at 3 out of 4, every single time. That was good. All right, here we go again. Faster, Student. See if that affects anything. What happened? [Inaudible 00:43:03] You're not putting it in correctly, that's human error, right, Student? 1 ...

[00:44:00] Okay, what are you guys working on next? I thought I saw you guys doing ... working on Crenshaw.

Students: No, we were just checking it out.

[00:46:00]

Teacher: Okay. All right. Before you go to work on that [inaudible 45:26]. Okay, all right, I think they'll recover pretty good. It's pretty much not undershooting it, so it's pretty good right now, because it actually looks like it's going lower. Because the walls are on.

Students: You can pick up against the ones that wrap underneath the thing now. Did you get the one that's ...

Students: You could play with the robot. Just practice with it.

Teacher: That was a big deal. I want to see some [inaudible 00:47:32], put it up against the fence. Which time is better ... you're driving one of those things?

[00:48:00]

Students: Bring down the power, baby. First shot takes a little.

Teacher: All right, so what do you find in there?

Students: A little bit of everything.

Teacher: Okay.

Students: Mostly the timing of the inserts and stuff.

Teacher: Increase the power?

Students: No.

[00:50:00]

Teacher: Okay, all right. Let me see what you get out of here.

Students: Student, you can take this ball.

Teacher: It's getting stuck now. You know what? I don't think that's a good idea. Right.

Students: I would've doubled it.

Teacher: All right, Student, what did you adjust on this next one?

Students: Power.

Teacher: Okay, you're decreasing it? All right. Slower between intervals, you're good. I don't know if that's a good idea. You know what it is? Stop pushing on the top. I think you've got to ... just aim it more accurate.

[00:52:00]

Students: That's not even ... the thing is [inaudible 00:52:08].

Teacher: It gets stuck on the standoffs even more.

Students: Yeah, intake.

Teacher: I don't think that's the solution.

Students: I'm just taking it down to Philly. All I got is 0009. That really makes it.

Teacher: Good, good. We're the 3 out of 4 shot team, and good at it. Looks like we'll do next fall. Okay. Do you have a couple more balls? Okay, Student.

Students: I cranked it way, way down.

Students: What are you guys going to do?

Teacher: Student. You've got it, why would you move? He moved. Got to get this.

[00:54:00]

Students: A little bit faster.

Teacher: You're writing a journal entry already for today, right?

Students: Yes.

Teacher: Okay. Student, count it all up. You know what? I've got to check my printer because I need the form.

[00:56:00]

Students: Hey man, we need the other good battery. We don't need [inaudible 00:56:13].

Teacher: I'll go check to see why it's not printing.

Students: Yeah, she's downloading it.

Teacher: Student, we're having the same issue, so hang on. Might have to go a couple of ... are you home, Student, or are you trying to print?

Students: Trying to print.

Teacher: How many of those have you taken?

Students: Two. Plug it in. It's good.

Teacher: Try it again, Student. No.

Students: That worked.

Teacher: Hang on. There you go.

Students: Thank you.

[00:58:00]

Teacher: Okay, might want to monitor that if it doesn't print. What'd you change?

Students: I upped the gain a little bit when I get into other aspects of it.

Teacher: Okay. Let me see how this one looks.

Students: Student.

Students: It's loading.

[01:00:00]

Teacher: Okay, so before the bell rings, just make sure ... let's recap a few things here. I know you guys are making up modifications, but again, the 3 things. Autonomous is the most important. Why is autonomous important? Somebody said, maybe, miss shots, but why is autonomous important?

Students: It's bonus points.

Teacher: The 10 bonus points is huge. Got to make that. Got to make your close shots, got to make your full court shots. That was a little too ... you want to grab this one? Okay, good. Slow it down, slowing down is good. Okay, so let's remember those 3 things now, the bell rang. Let's just remember: autonomous, full court and the close shots. Go. Okay. Student, down with the batter, can you grab that ball over there for me? All right, you guys are going to have to go back in and check on the ... make sure you guys do that. Don't forget your [inaudible 01:05:21].

[01:04:00]

Cameraman: What do you think about ... when do you think it would be good to post it?

Teacher: Whenever. Either, whenever. Is that okay?

Cameraman: Yeah.

Teacher: This is a grueling ... this is tough.

Cameraman: Yeah.

Teacher: This is industrial-grade parts, so there's a lot of tweaking. Sometimes you can work here but when you get out there, it just ... need more tweaking.

[01:06:00]

Cameraman: What's the most important variable? There's all kinds of variables.

Teacher: I think what they they try to do with the 6 motors, there's more motors for more power. I think that one has a little bit ... there's a little bit less ... a little bit more of a leeway to change things and help the shot. These ones are more sensitive, because it's not as

much power. They have a optimal range and once you change a variable, but a slight change, it starts [inaudible 01:06:34]. What's hard is, you change one and it's not like it's a one-to-one change, you change one and then it's fine; it may affect 2 other variables. They're constantly trying to compensate.

Students: The one time we get 4, you're not watching.

Teacher: You made 4?

Students: Yes.

Teacher: He made 4 shots, cool.

Cameraman: I'll have to check the camera.

Teacher: They always tell me. "Mr. Celia, I made 4 shots", I go, "No idea, I didn't see", they go, "No, it's when you weren't watching".

Students: You can't watch any of our matches.

Teacher: Okay, so if I don't watch your matches, you'll make all 4.

Students: Yes.

Teacher: Okay.