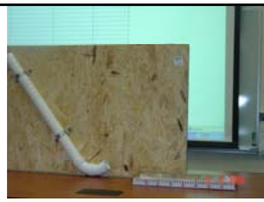
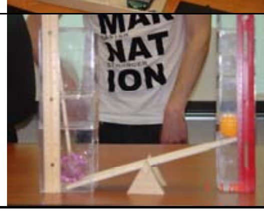
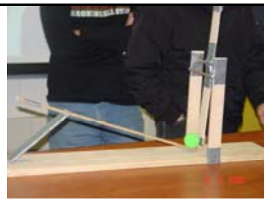
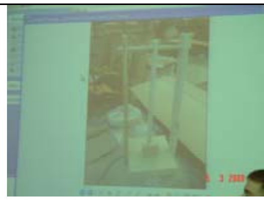
Engin 103 March 5, 2009 back to e-syllabus	Topics: Project 1 -Part I Presentations Logbook questions

Project 1 Part I Presentations: Design for System Predictability

Project 1 leaders: please copy this page and fill in your team response below. Then save as a web page: name “p1p1.html” and upload to your *files* folder.

Team #	**Picture of system** ***If you took a picture of the system you can insert it here, otherwise leave it blank, we will take care of it.**	**a) System name** **b) What are the input X and output Y along with their units**	**c) How did you design the system so it can produce at least 10 pairs of distinctive values for X and Y** **d) How did you reduce to a minimum any uncertainty in the system so to increase system’s predictability**	**e) What models may work for this system using the Spreadsheet?** **f) Which model you think will best describe the system, why?**
1		a) Compression System b) x: mass (g); y: compression(cm)	c) The spring can support more than 10 different inputs before becoming fully compressed d) Zeroed attached ruler; fixed tissue to base container to reduce wobbling while adding minimal resistance; minimal interaction allows for almost no human error.	e) linear, quadratic f) linear (similar to the most common spring potential energy equation)
2		a) Projectile launcher b) The input X is the distance the bungee cords are stretched and output Y is the distance ball travels. Both are measured in inches.	c) Stretching the bungee cords to different amounts produces 10 pairs of distinctive values for X and Y. d) We put a felt ring in the tube to hold the ball and we designed the stand to shoot the ball at the same angle.	e) quadratic f) The reason why we used the quadratic is because a projectile when launched at a 45 degree angle travels in a parabolic curve which can be described with a quadratic equation.

3		a) Ball Ramp b) The X input is the height interval of drop. The Y interval is the distance the ball travels from the bottom of our tube angle.	c) We cut 10 slots on our tube to represent 10 intervals of drop heights. And we measured in cm where the ball lands for distance depending on the drop interval d) We reduced some uncertainty by have one person release the ball each time, as well as one measuring. We also concentrated on removing the card in the same manner each time	e) Quadratic and Linear models both provide fairly accurate results f) Quadratic model. It has the smallest deviation and fits better to our results and predictions
4		A projectile motion of a ball X input is the angle in degrees and the Y output is the distance in meters.	We designed it in a way we could use different angles X to produce different values for the distance Y. We used a 45 degrees set square and measured 10 different angles on it to ensure the required distances.	The quadratic model may work for this system and this is what we will try to use. I think the quadratic model will best describe the system because the projectile motion of the ball will take a parabolic path.
5		Gear System: X input weight in lbs Y output force in lbs	We designed the system using distinct weights for the x value ranging from 2.5 – 9 lbs. The y value was a correlation of the multiplication of force from the gear system measured by a spring scale. 2.5 lbs for x resulted in 1.5 lbs for y	The linear model worked best for this system using the spreadsheet. The linear model best describes the system because we used a linear equation to solve for y to determine the theoretical output then we tested the system for the actual output. For 2.5 lbs X our theoretical output was 1.75 lbs. The actual output that we measured was 1.5 lbs
6		**The funnel** **X grams of sugar** **Time**	We timed different amounts to get an average We took multiple reading of each amount to get a better average	We can use the cubic model I think the linear model is the best for our system.
7		A) Ball Seesaw B) The larger ball dropping on the wider side of the seesaw is the X input. The Y output is the height that the smaller ball reaches after it is thrown up by the seesaw.	C) We made sure that we could measure the input and output. D) The system is contained within itself and does not use any external input.	E) Quadratic model will work best because it will show a parabola when graphed. F)Same as E.

8		a)“The Putter” b)X=mass of weight(gr) Y= distance ball travels up the ramp(cm)	c) We made the system such that the x input would be changeable without affecting the design of the system. d) To increase the system’s predictability we tested it out a few times after it was built to ensure there were no delays in its movements	e) The best model for the system would most likely be the linear and quadratic model. f) The best model for the system would be the quadratic because the values of Y don’t change as dramatically if it were a cubic model.
9		a)knuckle puck machine b)input X is height of the leading edge of the striker output Y is the distance the puck travels	c)The system was designed so that the height Y of the striker was increased the force exerted on the puck would increase, thus increasing the output X or the distance traveled d)The system was tested multiple times at each height to insure the highest degree of consistency in the	e) Cubic and quadratic models will work best in a spreadsheet f) The cubic system will give the most accurate results because it will have the lowest S parameter.
10				

According to Project 1 specifications (e-syllabus) the grading criteria are as follow:

Items	Points for both Part I and Part II
Project completed and presented	70
Project performance (perform tasks specified)	50
Good design	30
Project presentation and webpage	50

Project 1 -part I/ Teams	1	2	3	4	5	6	7	8	9	10
Project completed (35)	35	35	35	35	35	35	35	35	35	35
Design for predictability (15)	13	13	14	14	15	14	14	15	13	12
Performance& readiness (25)	22	25	25	22	24	24	23	24	23	23
Presentation (15)	15	15	15	15	15	15	15	15	15	15
Web page (10)										
Total part I (100)	85	88	89	86	89	88	87	89	86	85

back
back
back
back

LOGBOOK: example of a logbook page

-Use a quadrille notebook; number all pages; date all entries
-Write your notes for all activities, thoughts, problems and solutions, and learning conclusions related to Engin 103. You should write down progress, outcomes, and conclusions on projects and teamwork; conclusions from class work (including LabVIEW) and homework.
-In addition you should answer in the logbook all questions listed in these notes in blue, as shown below:

21) Sketch the system built by your team, describe the input and output variables on the sketch. What units will you measure these variables, and with what instruments.

22) Explain with a sketch the different design elements your team used to increase predictability. Explain what mathematical model will be the best to describe the system using the X and Y variables mentioned in the previous question.

back