**Roanoke Valley Governor’s School for Science and Technology  
Product Design Engineering  
Syllabus updated Aug 2022  
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1. **Course Information**
   1. **Course Description**

This class will offer many opportunities for students who have completed the Design Engineering and Fabrication class to develop more complex projects. Students will have more autonomy in choosing their projects and can work individually or with a partner. This class will be very hands-on and will include: CAD (Onshape ) training, 3-D printer fabrication, laser cutting fabrication, as well as programming. All students will design, build, and develop the code for an advanced engineering design project. Students will learn numerous skills in this class that will assist them as they move forward into their college career.

* 1. **Gifted education strategies**
     1. **Differentiation:** Instructor will differentiate/modify the curriculum and his instructional methods in response to the needs, strengths, learning styles, and interests of individual students so that all students have an opportunity to learn at their full potential. Differentiation typically involves modifying instruction in terms of **content** (skills to be learned)**, process** (activities designed to teach the skills)**, and product** (projects and assessments that demonstrate the extent to which the skills were learned).
     2. **An Emphasis on Higher-Level Thinking.** Students need to learn about important engineering concepts and also to manipulate those concepts in complex ways. Having students analyze the relationship between real world problems and seeing the connections between engineering and society provides opportunities for both critical and creative thinking within a problem-based episode.
     3. **An Emphasis on Inquiry, Especially Problem-Based Learning.** The more that students can construct their understanding about engineering for themselves, the better able they will be to encounter new situations and apply appropriate scientific processes to them. Through guided questions/problems by the teacher, collaborative dialogue and discussion with peers, and individual exploration of key questions, students can grow in the development of valuable habits of mind found among engineers.
     4. **Higher Order Thinking:** Advanced questioning in discussions and providing activities based on the six levels of the ‘Revised Bloom’s Taxonomy of Higher-Order Thinking Skills.’The process verbs, activities, and products range from simple and factual thinking to more complex and abstract levels of thinking.
     5. **An Emphasis on Learning the Scientific Process, Using Experimental Design Procedures.** Engineering design activities will be used in the classroom to expose students to the design cycle and the need to work collaborative.

**Text, Printed Resources, and Media Resources**

* + Handouts by your instructor.
  + Websites
  + Professional documents developed by the student.

1. **Grading Policy**
   1. **Grading Scale**

100-90% **A**

89-80% **B**

79-70% **C**

69-60% **D**

59-0% **F**

* 1. **Types of Evaluations**
* Progress checks
* Class participation checks
* Class presentations
* Portfolios
* Requirements for Project Forum
* Final Project Evaluation
  1. **Final Grade Determination**

The final grade is the average of the 2 semester grades. Students who fail to maintain a B average or above will be subject to the RVGS probationary policy.

1. **Class Policies and Procedures**
   1. **Absences and tardies:** The policy in the RVGS student handbook will be followed.
   2. **Late-work policy:** Deadlines on all homework and labs will be critical. Prior contact with the teacher before a deadline is necessary for consideration of extensions. Contact after a missed deadline is inadequate. A late minor assignment will be earn half credit. After 2 days assignments will not be accepted. Late major assignments will be lowered 10 % each calendar day.
   3. **Cheating:** The policy in the RCPS student code of conduct will be followed.
   4. **Technology Policy:** The RCPS Acceptable Use Policy and the RVGS student handbook policy will be followed.
   5. Grades are available at all times through Synergy. When viewing your grades, understand that:
      1. A blank in the grade book means that the assignment has not yet been graded. Teachers will have all assignments graded within 5 school days of the due date (with the exception of very long assignments which will be graded within 10 school days). You may have a blank because the teacher has not graded the class set or because your assignment was turned in after the due date. Blanks do not count as zeros in your average.
      2. A zero in the grade book means that you have earned a zero on the assignment. Cases in which this might occur include submitting incorrect answers to an assignment or submitting an assignment past the due date.
      3. An excused (EX) in the grade book means that you are excused from the assignment without penalty.
   6. **Interim Reports:** The interim report is a snapshot of the current class average. Please feel free to discuss your report with your instructor.
   7. **Student Performance Strategy:** Interventions will be implemented at the teacher’s discretion or in the event that the student's grade falls below an 80.
   8. **General classroom procedures:**
      1. Personal Electronic Equipment:
         1. Cell Phones are not to be used in class and will be confiscated if they ring, vibrate or the student is found using the phone for texting.
         2. Any student found with a cell phone during an assessment (quiz, test, or exam), will receive a zero on the assessment.