

**Computer Aided Drafting and Design/Applied Robotic Engineering  
(CADD-ARE)  
Mr. Randy Grove  
White Oak Middle School; Rooms: 233, 125  
Computer Science Teacher  
Please email questions or concerns to: [Randall\\_A\\_Grove@mcpmsmd.org](mailto:Randall_A_Grove@mcpmsmd.org)**

**Course Description**

Students will develop a fundamental understanding of Engineering Design through the application of Robotics Technology and Computer Aided Drafting/Design (CADD). Included is a practical study of the cultural, social, economic, environmental and political effects of technology; the role of society in the development and use of technology; and the influence of technology on history. Students will engineer design and strengthen their ability to troubleshoot systems, research and develop, invent and be innovative, and experiment using models to problem solve while learning to use and maintain technological systems.

**Instructional Approach**

The Design Process that has been adopted is based upon the 12 Step Engineering Design Model. The 12 steps are:

1. defining a problem
2. brainstorming
3. researching and generating ideas
4. identifying criteria and specifying constraints
5. exploring possibilities
6. selecting an approach
7. developing a design proposal
8. making a model or prototype
9. testing and evaluating the design using specifications
10. refining the design
11. creating or making it
12. communicating processes and results

The course is about teaching the engineering design process and as many of the elements of design necessary to accomplish that effectively as possible. The goal of the four units in this course is to take students through the twelve steps listed above four or five times. Approximately every nine weeks, the teacher takes students back through the engineering design process to strengthen skills, build in-depth knowledge and increase rigor as design topics are revisited.

In the program students are expected to:

1. Develop thinking skills by solving real-world engineering problems;
2. Use computer software to produce, analyze, and evaluate models of project solutions;
3. Use industry-standard computer software in testing and analyzing digital circuitry;
4. Use three-dimensional computer software to solve design problems. They assess their solutions, modify their designs, and use prototyping equipment to product 3-D models; and
5. Work in teams to complete challenging, self-directed projects. Mentored by engineers, students design and build solutions to authentic engineering problems.

**Units of Study**

- Design
- Development and Use of Technology
- Technological Impacts and Social Responsibility
- Technological Abilities

**Instructor**

Mr. Grove is in his second year of teaching at White Oak Middle School and his eighth year in Montgomery County Public Schools. He has earned a Bachelor of Elementary Education degree from Penn State University and a Master of Education degree from Loyola College of Baltimore.

**I have read and reviewed the syllabus with my child:** \_\_\_\_\_

Parent/Guardian Signature

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Student Name