MVLA
2025-26
COURSE INFORMATION SHEET

Course Title: Design and Fabrication
CTE Pathway Sequence: Manufacturing and Product Development
School: LAHS
UC/CSU requirement: No (G - Approved Elective)
MVLA Graduation requirement: No (General Elective)
Textbook and/or other learning resources: Youtube and other online materials

Course Description/Student Learning Outcomes:

Design and Fabrication is a course meant to expose students to the ideas of computer aided design (CAD), computer aided machining (CAM) and modern woodworking and metalworking construction practices. Throughout the year students will learn to design using 2D modeling software such as adobe illustrator, and 3D modeling software such as Fusion 360. Projects will be completed with the help of 3D printers, laser cutters,hand held shop tools and machine shop tools.

Expected School-wide Learning Results:
1. Collaborative Learners - Students will be able to complete cognitive and hands-on assignments in cooperative student groups. Students will acknowledge and fulfill their responsibilities in the group and be active contributors.

2. Self-Directed Learners - Students will develop and demonstrate initiative and responsibility by always trying to complete tasks when faced with challenges. Students should be able to problem solve independently and create new products using techniques that will apply to a variety of situations and many aspects of today's technology.

3. Critical Thinkers- Students will learn to evaluate electronically created designs for feasibility, and to take multiple real-life factors into account when creating products.

4. Knowledgeable Individuals- Students will learn problem-solving techniques that will apply to a variety of situations, as well as specific design and fabrication knowledge which will allow them to understand many aspects of today's product development systems and technology.

By the end of the year students will know how to:
1. Safely operate various woodworking and metalworking machine shop tools
2. Design and build full size, structurally sound three dimensional objects
3. Use 3D printed and laser cut models to plan and build life size products
4. Use modern wood and metal working tools to create products for clients
5. Work in a team to design and build large structures and vehicles

Course Outline/Units of Study/CTE Industry Standards(If applicable to your course):

D1.0 Understand the basic product design and development process as it relates to the design of a product, line of products, system design, or services.
D2.0 Understand and apply research methodologies as a means to identify a need, problem, or opportunity for a new product, product line, system design, or service.
D3.0 Understand and apply various ideation techniques to develop ideas and concepts.
D5.0 Develop the concept into a well-defined product for prototyping.
D6.0 Produce a prototype of a product.
D7.0 Evaluate the prototype to determine if it meets the requirements and objectives.
D8.0 Understand and apply basic business and entrepreneurial principles and identify potential markets and/or other business opportunities for distribution of the product.
D10.0 Produce a presentation of the product, product line, system design, or service.

Assessment and Grading (BP 5121 / AR 5121**):** To ensure that every student has an equal opportunity to demonstrate their learning, the course instructors implement aligned grading practices and common assessments with the same frequency.

1. Grading categories and their percentage weights:
   Productivity and In Class Learning 20%
   Assignments 15%
   Reporting and Recording Progress 15%
   Safety Quizzes and Procedures 10%
   Projects 40%

2. Achievement evidence collected within each grading category:
   Productivity and Synchronous Learning: Daily attendance and participation in synchronous classes will be monitored, daily progress toward project/assignment completion and revision will be assessed.
   Asynchronous Assignments: Participation and completion of asynchronous assignments will be monitored and progress toward project/ assignment completion will be assessed
   Reporting and Recording Progress: Students are required to keep and complete a running log of their progress on each project every class period.
   Safety Quizzes and Procedures: Students will be assessed on their knowledge of the safe and proper use of hand and power tools.
   Projects: Individual and group projects, when possible, will be assessed based on each students' initial understanding of the required tools and the individual students' effort and revisions.

3. Grading scales: A 90% -100%, B 80% - 89%, C 70% -79%, D 60% - 69%, F below 60%

4. Homework/outside of class practices (AR 6154): Assignments and projects are assigned and usually completed during class time but can be worked on outside of class. They are due based on the required date and time, and will be checked for completion and correctness.

5. Excused absence make up practices(Education Code 48205(b)): Students who need extra time in the workshop due to excused absences must make appointments with the teacher. If a student has an excused absence, daily homework or missed summative assessments will be accepted with one extra day allowed for each day of the absence.

6. Academic integrity violation practices (LAHS Academic Integrity Policy): Honesty, trust and integrity are vital components of the education process. The Governing Board believes that academic honesty and personal integrity are fundamental components of a student's education and character development. The Board expects that students will not cheat, lie, plagiarize or commit other acts of academic dishonesty.
   Students and families should understand and act upon the values of academic integrity and should encourage the highest standards of academic behavior from themselves and their peers.

   It is assumed that all work completed for a class is original work created for that class, for a specific assignment. Please refer to the Academic Integrity policy in the student handbook. For categories A and C, the "V" will be worth zero. For violations in category B students will receive a failing grade.

7. Late work practices: Students who need extra time in the workshop due to excused absences must make appointments with the teacher. Late assignments are accepted for ½ credit.

8. Revision practices: All projects are expected to be revised repeatedly until the due date. After a project has been turned in no more revisions will be accepted

9. Extra credit practices: No extra credit will be assigned.

10. Additional grading practices: None

11. LMS Used: Canvas

Instructors' email addresses:

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Additional information: This class is taught by Career Technical Education certified teachers in Manufacturing and Product Development.