

FORM 400**CURRICULUM PROPOSAL**

Fern Ridge School District 28J

1. Name of Course or Activity: **Engineering** School: **FRMS**2. Check One: Change in old course **New Course**3. Implementation Dates: **Beginning Fall 2026**

4. Target Group: **7th and 8th Grade Students at FRMS; students in building, architectural design, and mechanical engineering. Students who want to learn how things work so they can manufacture their own amazing machines and prototypes.**

5. Course Description: See attached completed “Planned Course Statement”.

6. Rationale: (What problem or need will this proposal resolve? How will this goal be accomplished? Use additional pages if necessary.)

Where structure and science meet, this class will explore the mechanical side of science through engineering, engines, and functional design. Students will participate in hands on activities by building and doing to create designs for the future.

Adding this elective to Fern Ridge Middle School will allow us to continue to provide students, through our electives, the chance to explore and learn more about the things that interest them.

Budget Estimate:

	Amount	Explanation
Personnel	_____	_____
Supplies	_____	_____
Equipment	_____	_____
Travel	_____	_____
Other	_____	_____
Total	_____	

Initiator(s) **Nick James**
School **Fern Ridge Middle School**

Position: **Teacher**
Date **4-9-26**

FORM 401

SIGNATURES REQUIRED FOR A PROPOSED CHANGE IN THE CURRICULUM

Fern Ridge School District

PROPOSAL IDENTIFICATION: Engineering

INITIATOR: Nick James

1. Submitted to: _____ Date: _____
(Curriculum Associate)

Signature: _____ Date: _____

2. Submitted to: Olivia Johnson Date: 4/10/26
(Supervising Administrator)

Signature: [Signature] Date: 4/10/26

3. Submitted to: Michelle Marshall Date: 4/14/26
(Curriculum Council Chairperson)

Recommendations of the Curriculum Council: Approved pending
Supt & Board approval

Signature: Michelle Marshall Date: 4/14/26

4. Submitted to: _____
(Superintendent)

Final action taken: _____ Implementation as submitted is authorized
_____ Implementation with specified modification is authorized
_____ Implementation is not authorized

Explanation: _____

Signature: _____ Date: _____

Fern Ridge Middle School

Teacher and Room Number: Nicholas James
E-Mail:njames@fernridge.k12.or.us Phone:

Course Outline and Syllabus (Core Classes)

Course Name: Engineering

Course Description:

Engineering is an elective class that will explore math and science concepts through the lens of projects. Projects will involve building, exploring, and solving large questions with other students.

Content Covered:

Fundamental Physics concepts: Newtons Laws, Speed, Velocity, Acceleration, Momentum, Gravity, Friction, Flight, Pressure, and Waves

Fundamental Math Concepts: Basic Arithmetic, Basic Algebra, and Graphing

Basic Engineering Practices: Following scientific method and engineering protocol.

How Students Working Below Grade Level Will Be Supported:

Students will be able to be supported through.

- Scaffolding large concepts
- Creating obtainable goals
- Hands on learning
- Meeting appropriate IEP support and Meeting 504 requirements
- Creating a fun and interesting learning atmosphere

How Students Working Above Grade Level Will Be Challenged:

Students above grade level will be challenged by

- Increasing the amount of calculation required to show their understanding
- Making the limitation of the projects more strict, either in time or materials
- Asking students that are ahead of the class to help support other students that are struggling.

Prioritized Content Standards:

MS.ETS1 Engineering Design

MS.ETS1.1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. ^

MS.ETS1.2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS.ETS1.3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS.ETS1.4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Textbook(s):

Novel Engineering, K-8: An Integrated Approach to Engineering and Literacy
by Elissa Milto (Author), Meredith Portsmouth (Author), Jessica Watkins (Author)

Awesome Engineering Activities for Kids: 50+ Exciting STEAM Projects to Design and Build (Awesome STEAM Activities for Kids) Paperback – May 28, 2019
by Christina Schul (Author)

Course Goal(s):

1. Create an understanding of the basic engineering method
2. Learning fundamental principles of physics
3. Learning fundamental part of math
4. Creatively thinking about difficult questions and coming up with unique solutions
5. Building and failing and building again. Being able to try and learn.

Materials Needed:

Popsicles Sticks, Glue , Straws, Paper cups, Balloons, Wheel Kits, Car kits, Mouse Traps, Duct Tape, Eggs, Cloth, String, Cardboard, Heavy Paper, Balsa Wood, Wood Glue

Classroom Rules:

The school's high five rules.

Be responsible

Be Respectful

Follow directions

Be There- Be Ready

Hands and Feet to Self

How Students Will Be Graded:

Students will be graded on an A-F grading system.

A- 100-90

B 89-80

C 79-70

D 69-60

F 59-0

Student will be grade both on Daily Assignments and larger projects

Homework Policies

All work may be turned in by the end of each quarter without a late penalty.

Scope and Sequence Planning Sheet- For each of the months below, include the major concepts and skills you hope to cover that month.

September:

Basic engineering concepts.

Newtons laws of motion

Distance

Time

Measurement

Speed- Determining how to calculate and graph

Project: Building math box cars, balloon cars, and mouse trap cars

October:

Calculations of

Acceleration

Moementum

Friction

Project:
Egg Drop
Encline Cup Dop
Parachute

November:

Buoyancy
Surface Area/ Volume
Propulsion
Water displacement

Project
Boat building

December:

Geometry

Civil engineering projects

Building structure that can support the most weight
Bridges
towers

January:

Projectile Motion
Basic Trigonometry

Project
Rockets

Febuary:

Basic engineering concepts.
Newtons laws of motion
Distance
Time
Measurement
Speed- Determining how to calculate and graph

Project: Building math box cars, balloon cars, and mouse trap cars

March:

Calculations of
Acceleration
Momentum
Friction

Project:
Egg Drop
Encline Cup Dop
Parachute

April:

Buoyancy
Surface Area/ Volume
Propulsion
Water displacement

Project
Boat building

May:

Geometry

Civil engineering projects

Building structure that can support the most weight
Bridges
towers

June:

Projectile Motion
Basic Trigonometry

Project
Rockets