REQUEST TO ADD/REVISE A COURSE

Forest Lake Area Schools

Primary Contact: Mike Miron	Department: CTE
Career Pathway: Transportation Careers/Heavy Equipment	Subject: Trades & Industry
Grade Level(s)/Building(s): 11-12/FLAHS	Proposed Course Start Date: Fall 2026
Department Members involved in the development of the course proposal: Industrial Technology, Molly Bonnett, Trade & Industry Advisory Board	

Is your department currently in Instructional Review?		Requesting FastTrack due to an urgent department need or concern?
☐ Yes ** For all departments in the instructional review process, new courses will be developed as part of that work.*	☑ ~~No~~ What approximate year is your department scheduled to begin?	☐ Yes ☑ ~~No~~

PART I (complete with department colleagues)

COURSE PROPOSAL NARRATIVE

A. Course Information

Proposed Course Title: Basic Grade & Construction Math	Length of Course: Semester

Course Description as it will appear in the registration guide:

In the construction industry, grading is the work of ensuring a level base, or a grade with a specific slope. Grade construction work is needed in almost any building project, from laying a building foundation to landscaping to roadwork. In this course, you will be introduced to core equipment used in the staking process, as well as personal protective equipment (PPE) used in the construction industry. Communication processes used in the construction industry for interpreting and setting grade are also an important part of this course. Finally, you will learn mathematical concepts related to the construction industry for grade staking.

B. Background: Describe the process that led to this request.

Gaps/Needs | State the current issues and gaps for why this course is needed.
Key considerations: What standards are currently not being met? What skills are not currently being taught? What data support these conclusions? What other relevant needs would this course address? Can an existing course be modified to address the same concerns? Why or why not?

No courses such as this are currently offered in our system. FLAS was presented with this partnership opportunity by the Local 49 because of our robust CTE programming. They believe that we have the infrastructure in place to provide this learning opportunity to students. Students have the opportunity to earn college credit and time toward the union apprenticeship program.

Standards | Indicate the state, national, or professional standards to which this course could be aligned.

Courses align with Local 49 Union Standards for apprenticeship.

MN CTE Frameworks:
TB.02.01 Demonstrate mathematics knowledge and skills required to pursue the full range of post-secondary education and career opportunities
TB.02.03 Apply measurement systems and the mathematical functions necessary to perform required repair, maintenance, fabrication, and operation procedures

***There are likely also math standards that are met as a result of this content.*

Rationale | How does this course support the needs outlined above?
Key Considerations: Describe how this course supports the district strategic plan and/or the Middle School Course of Study redesign and learning statements. Describe the Pathways/Design opportunities this new course would create for your students & department. Include any relevant advances in your content area that support the need for this new course.

- The International Union of Operating Engineers Local 49 has partnered with Minnesota Virtual Academy and Stride Career Prep to offer the Operating Engineers Pathway.
- Students can take four, one-semester classes to explore careers in equipment operation.
- Each year there are multiple opportunities for students to participate in hands-on training opportunities, including visits to contractors.
- Students will receive credit toward Local 49's Apprenticeship Program based on the number of courses completed and events attended.
- Participants have access to career counseling and guidance into the operating engineer field for apprenticeships.
- Students may enroll in one or more courses. They don't need to commit to all courses and can be enrolled based on skill and educational level. These courses have flexible schedules to allow students to remain enrolled at their brick-and-mortar schools.
- Classes are eligible for high school credit, college credit with North Hennepin Community College and apprenticeship credit with the International Union of Operating Engineers' apprenticeship program.

ADDITIONAL FACTORS TO CONSIDER

	Consider & Describe Impact
Similar programs in other departments/grade levels	Automotive
Credit and prerequisite considerations	

Anticipated major expenditures (specialized equipment, software, textbooks)	Sponsored
Space Considerations (classroom/lab needs, storage, furniture, etc.)	Potential off-site venue
Schedule Considerations (time of year, block vs. skinny, etc.)	Potentially paired with another course to create a “block” at the end of the day.
Technology Considerations (access to current software & equipment, etc.)	TBD
Other	

PART II (Complete with T&L following building administrative approval)

C. Goals and Learning Outcomes

Long Term Goals for the Course | Identify desired results - what will students be able to do independently?

Students will be able to make progress toward becoming a heavy equipment operator.

Standards | Indicate the state,national or professional standards to which this course is aligned.
(Copy and Paste standard and benchmarks)

Courses align with Local 49 Union Standards for apprenticeship.

TB.02.01 Demonstrate mathematics knowledge and skills required to pursue the full range of post-secondary education and career opportunities
TB.02.03 Apply measurement systems and the mathematical functions necessary to perform required repair, maintenance, fabrication, and operation procedures

***There are likely also math standards that are met as a result of this content.*

Essential Learning & Skills | Describe the essential learning and skills addressed in this course. Students will know and be skilled at:

Attached.

D. Course Content

Course Outline | Add units and any key experiences or projects that students will engage in.

Attached.

E. Budget Considerations

Materials, Equipment, Supplies | List any new resources not already available necessary for this course. This might include subscriptions, technology, or other various resources needed for the course.	
___ *Textbooks* Title(s): Approximate total cost:	___ *Digital Curriculum Resources* Title(s): Approximate total cost: One-time cost or annual renewal?
___ *Other Curriculum Materials (consumables, supplies, ancillaries, etc.)* Materials: Consumable/non-consumable? Approximate total cost:	___ *Technology Devices/Equipment/Hardware* Devices/equipment needed: Approximate cost:
___ *Staff Development* Staff Development description: Approximate cost: Frequency (one time? yearly?):	____ Follow Up Plan Additional Staff Development Check in Meetings

FINAL APPROVAL PRIOR TO SCHOOL BOARD MEETING

John-Paul Jacobson _____ Director of Teaching and Learning Signature November 6, 2025
Proposed School Board Meeting Date:

MFG010E2 Basic Grade and Construction Math INTL

Day	Lesson Name	Assignment Given (if applicable)	Assignment Due (if applicable)
1	DCA Introduction		
2	Unit 1: Measurement 1.01 Perimeter	1.01 Quiz: Perimeter	1.01 Quiz: Perimeter
3	Unit 1: Measurement 1.02 Rectangle and Triangle Areas		
4	Unit 1: Measurement 1.02 Rectangle and Triangle Areas	1.02 Quiz: Rectangle and Triangle Areas	1.02 Quiz: Rectangle and Triangle Areas
5	Unit 1: Measurement 1.03 Volume of a Prism		
6	Unit 1: Measurement 1.03 Volume of a Prism	1.03 Quiz: Volume of a Prism	1.03 Quiz: Volume of a Prism
7	Unit 1: Measurement 1.04 Engineer's Scale		
8	Unit 1: Measurement 1.04 Engineer's Scale		
9	Unit 1: Measurement 1.05 Engineer's Measurement		
10	Unit 1: Measurement 1.05 Engineer's Measurement		
11	Unit 1: Measurement 1.06 Basic Grades Formulas		
12	Unit 1: Measurement 1.06 Basic Grades Formulas		
13	Unit 1: Measurement 1.07 Basic Quantities: Area and Volume		

14	Unit 1: Measurement 1.07 Basic Quantities: Area and Volume		
15	Unit 1: Measurement 1.08 Graded Assignment: Area and Volume	1.08 Graded Assignment: Area and Volume	1.08 Graded Assignment: Area and Volume
16	Unit 1: Measurement 1.09 Video: Stockpile 1		
17	Unit 1: Measurement 1.10 Video: Stockpile 2		
18	Unit 1: Measurement 1.11 Basic Quantities: Stone and Material Stockpiles		
19	Unit 1: Measurement 1.12 Graded Assignment: Stone and Material Stockpiles	1.12 Graded Assignment: Stone and Material Stockpiles	1.12 Graded Assignment: Stone and Material Stockpiles
20	Unit 1: Measurement 1.13 Quiz: Measurement	1.13 Quiz: Measurement	1.13 Quiz: Measurement
21	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.01 Soil Compaction Activity 1		
22	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.01 Soil Compaction Activity 1		
23	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.02 Soil Compaction Activity 2		
24	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.02 Soil Compaction Activity 2		
25	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.03 Soil Compaction Activity 3		
26	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.03 Soil Compaction Activity 3		

27	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.04 Quiz: Soil Compaction	2.04 Quiz: Soil Compaction	2.04 Quiz: Soil Compaction
28	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.05 Engineer's Scale		
29	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.05 Engineer's Scale		
30	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.06 Graded Assignment: Engineer's Scale	2.06 Graded Assignment: Engineer's Scale	2.06 Graded Assignment: Engineer's Scale
31	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.07 Elevations: Guided Notes		
32	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.08 Elevations		
33	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.08 Elevations		
34	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.09 Stationing: Guided Notes		
35	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.10 Stationing		
36	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.10 Stationing		
37	Unit 2: Soil Compaction, Engineer's Scale, Elevation, and Stationing 2.11 Quiz: Soil Compaction, Engineer's Scale, Elevation, and Stationing	2.11 Quiz: Soil Compaction Engineer's Scale Elevation and Stationing	2.11 Quiz: Soil Compaction Engineer's Scale Elevation and Stationing
38	Unit 3: Slopes and Cross Sections 3.01 Slope as a Rate		
39	Unit 3: Slopes and Cross Sections 3.01 Slope as a Rate	3.01 Quiz: Slope as a Rate	3.01 Quiz: Slope as a Rate
40	Unit 3: Slopes and Cross Sections 3.02 Decimals and Percents	3.02 Discussion: Planning with Proportions	

41	Unit 3: Slopes and Cross Sections 3.02 Decimals and Percents	3.02 Quiz: Decimals and Percents	3.02 Quiz: Decimals and Percents
42	Unit 3: Slopes and Cross Sections 3.03 Fractions and Percents		
43	Unit 3: Slopes and Cross Sections 3.03 Fractions and Percents	3.03 Quiz: Fractions and Percents	3.02 Discussion: Planning with Proportions 3.03 Quiz: Fractions and Percents
44	Unit 3: Slopes and Cross Sections 3.04 Similarity and Scale		
45	Unit 3: Slopes and Cross Sections 3.04 Similarity and Scale	3.04 Quiz: Similarity and Scale	3.04 Quiz: Similarity and Scale
46	Unit 3: Slopes and Cross Sections 3.05 Slopes		
47	Unit 3: Slopes and Cross Sections 3.05 Slopes		
48	Unit 3: Slopes and Cross Sections 3.06 Slopes Handout		
49	Unit 3: Slopes and Cross Sections 3.07 Cross Sections		
50	Unit 3: Slopes and Cross Sections 3.07 Cross Sections		
51	Unit 3: Slopes and Cross Sections 3.08 Quiz: Slopes and Cross Sections	3.08 Quiz: Slopes and Cross Sections	3.08 Quiz: Slopes and Cross Sections
52	Unit 4: Measuring Elevations 4.01 Integers on a Number Line	4.01 Discussion: Integers on a Number Line	
53	Unit 4: Measuring Elevations 4.01 Integers on a Number Line	4.01 Quiz: Integers on a Number Line	4.01 Quiz: Integers on a Number Line
54	Unit 4: Measuring Elevations 4.02 Adding Integers		

55	Unit 4: Measuring Elevations 4.02 Adding Integers	4.02 Quiz: Adding Integers	4.02 Quiz: Adding Integers
56	Unit 4: Measuring Elevations 4.03 Subtracting Integers		4.01 Discussion: Integers on a Number Line
57	Unit 4: Measuring Elevations 4.03 Subtracting Integers	4.03 Quiz: Subtracting Integers	4.03 Quiz: Subtracting Integers
58	Unit 4: Measuring Elevations 4.04 Decimals on a Number Line		
59	Unit 4: Measuring Elevations 4.04 Decimals on a Number Line	4.04 Quiz: Decimals on a Number Line	4.04 Quiz: Decimals on a Number Line
60	Unit 4: Measuring Elevations 4.05 Adding Decimals	4.05 Discussion: Adding Decimals	
61	Unit 4: Measuring Elevations 4.05 Adding Decimals	4.05 Quiz: Adding Decimals	4.05 Quiz: Adding Decimals
62	Unit 4: Measuring Elevations 4.06 Subtracting Decimals		
63	Unit 4: Measuring Elevations 4.06 Subtracting Decimals	4.06 Quiz: Subtracting Decimals	4.06 Quiz: Subtracting Decimals
64	Unit 4: Measuring Elevations 4.07 Elevations Measurement Activity 1		4.05 Discussion: Adding Decimals
65	Unit 4: Measuring Elevations 4.08 Elevations Measurement Activity 2		
66	Unit 4: Measuring Elevations 4.09 Quiz: Elevations Measurement	4.09 Quiz: Elevations Measurement	4.09 Quiz: Elevations Measurement
67	Unit 4: Measuring Elevations 4.10 PPE and Safety		
68	Unit 4: Measuring Elevations 4.10 PPE and Safety		

69	Unit 4: Measuring Elevations 4.11 Use of a Direct Elevation Rod with Rotating Laser Part 1: Set-Up		
70	Unit 4: Measuring Elevations 4.12 Use of a Direct Elevation Rod with Rotating Laser Part 2: Using a Direct Elevation Rod		
71	Unit 4: Measuring Elevations 4.13 Use of a Direct Elevation Rod with Rotating Laser Part 3: Application		
72	Unit 4: Measuring Elevations 4.14: Areas of Circles 1	4.14 Quiz: Areas of Circles 1	4.14 Quiz: Areas of Circles 1
73	Unit 4: Measuring Elevations 4.15 Areas of Circles 2	4.15 Quiz: Areas of Circles 2	4.15 Quiz: Areas of Circles 2
74	Unit 4: Measuring Elevations 4.16 Radius		
75	Unit 4: Measuring Elevations 4.16 Radius		
76	Unit 4: Measuring Elevations 4.17 Quiz: Measuring Elevations	4.17 Quiz: Measuring Elevations	4.17 Quiz: Measuring Elevations
77	Unit 5: Plans 5.01 Roadway Plans		
78	Unit 5: Plans 5.01 Roadway Plans		
79	Unit 5: Plans 5.02 Plan Views		
80	Unit 5: Plans 5.02 Plan Views		
81	Unit 5: Plans 5.03 D.O.T. Roadway Plan Reference		
82	Unit 5: Plans 5.04 Quiz: Roadway Plan	5.04 Quiz: Roadway Plan	5.04 Quiz: Roadway Plan

83	Unit 5: Plans 5.05 Site Plans		
84	Unit 5: Plans 5.06 Site Plans Reference		
85	Unit 5: Plans 5.07 Quiz: Site Plans	5.07 Quiz: Site Plans	5.07 Quiz: Site Plans
86	Unit 5: Plans 5.08 Plan Abbreviations		
87	Unit 5: Plans 5.09 Construction Site Inspection Report		
88	Unit 5: Plans 5.10 Beginning GNSS		
89	Unit 5: Plans 5.10 Beginning GNSS		
90	Final Exam	Final Exam	Final Exam