

**Course number:** PRDV 74727

**Title:** Young Makers and the Universe

**Date:** Fall 2021

**Credit:** 1

**Location:** Online

**Visiting Instructor:** Katherine Kaczynski

**Email:** [kkaczynski@framingham.edu](mailto:kkaczynski@framingham.edu)

**Cell:** 508-574-9485

Note: When contacting me by email, please state the course name in the subject area.

## Course Overview

### Course Description:

This course is designed for preschool to grade 6 teachers and specialists. Each module, with its special topics, examines the impact that MakerSpaces have on student's Pre-K to grades 5.

- Participants will explore the pedagogy of MakerSpaces.
- Participants will become familiar with the Massachusetts Curriculum Frameworks, Pre-5, Physical Science, PS 1-4, Technology and Engineering, ETS1 - which supports MakerSpace across grade levels and subject areas.
- Participants will explore the resources, and content within each weekly module, and complete all readings (text, videos) prior to the online discussions.
- Participants will come prepared for in-depth discussions and ready to participate actively in the online discussion forum, from the start to the completion of the week. A final project is required.

Emphasis is placed on but not exclusive to the following standards:

### **PS2. Motion and Stability: Forces and Interactions**

PreK-PS2-1(MA). Using evidence, discuss ideas about what is making something move the way it does and how some movements can be controlled.

PreK-PS2-2(MA). Through experience, develop awareness of factors that influence whether things stand or fall.

PS2. Motion and Stability: Forces and interactions

K-PS2-1. Compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.

### **Grade 1: Technology/Engineering**

ETS1. Engineering Design

1.K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change that can be solved by developing or improving an object or tool.\*

1.K-2-ETS1-2. Generate multiple solutions to a design

### **Grade 2: Technology/Engineering**

ETS1. Engineering Design

2.K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same design problem to compare the strengths and weaknesses of how each object performs.\*

### **Grade 3: Technology/Engineering**

## ETS1. Engineering Design

3.3-5-ETS1-1. Define a simple design problem that reflects a need or a want. Include criteria for success and constraints on materials, time, or cost that a potential solution must meet.\*

3.3-5-ETS1-2. Generate several possible solutions to a given design problem. Compare each solution based on how well each is likely to meet the criteria and constraints of the design problem.\*

3.3-5-ETS1-4(MA). Gather information using various informational resources on possible solutions to a design problem. Present different representations of a design solution.\*

### **Grade 4: Technology/Engineering**

## ETS1. Engineering Design

4.3-5-ETS1-3. Plan and carry out tests of one or more design features of a given model or prototype in which variables are controlled and failure points are considered to identify which features need to be improved. Apply the results of tests to redesign a model or prototype.\*

4.3-5-ETS1-5(MA). Evaluate relevant design features that must be considered in building a model or prototype of a solution to a given design problem.\*

### **Grade 5: Technology/Engineering**

## ETS3. Technological Systems

5.3-5-ETS3-1(MA). Use informational text to provide examples of improvements to existing technologies (innovations) and the development of new technologies (inventions).

Recognize that technology is any modification of the natural or designed world done to fulfill human needs or wants.

5.3-5-ETS3-2(MA). Use sketches or drawings to show how each part of a product or device relates to other parts in the product or device.\*

### **Grade 6: Technology/Engineering**

## ETS2. Materials, Tools, and Manufacturing

6.MS-ETS2-1(MA). Analyze and compare properties of metals, plastics, wood, and ceramics, including flexibility, ductility, hardness, thermal conductivity, electrical conductivity, and melting point.

6.MS-ETS2-2(MA). Given a design task, select appropriate materials based on specific properties needed in the construction of a solution.\*

Clarification Statement:

- Examples of materials can include metals, plastics, wood, and ceramics.

6.MS-ETS2-3(MA). Choose and safely use appropriate measuring tools, hand tools, fasteners, and common hand-held power tools used to construct a prototype.\*

Clarification Statements:

- Examples of measuring tools include a tape measure, a meter stick, and a ruler.
- Examples of hand tools include a hammer, a screwdriver, a wrench, and pliers.
- Examples of fasteners include nails, screws, nuts and bolts, staples, glue, and tape.
- Examples of common power tools include jigsaw, drill, and sanders

### **Course Content:**

Week 1 - Module: The MakerSpace Movement

Week 2- Module: Young Makers & MakerSpaces

Week 3- Module: Makers and STEM

Week 4- Module: Bringing MakerSpace into the Classroom

### **Student Outcomes**

Students will be able to:

- Define MakerSpaces
- Identify and explore connections across Literacy, Math, Science & Technology Curriculum Frameworks.
- Describe and discuss the impact of MakerSpaces on teaching and learning.
- Examine how to apply this information to the classroom practices
- Discuss and explore ways to develop or further develop MakerSpaces

### **Grading Components:**

40 points = Readings and Videos (tied to the frequency and quality of posts (See Rubric for Discussion Board).

40 points = Weekly Assignments (See Rubric for Weekly Assignments).

20 points = Final Project: PowerPoint, Prezi, Podcast, Adobe Spark or Research Paper (APA)

**100 points**

#### **Grading/Grade Points**

A, A- (95-100 A, 90-94 A-) Indicates that the level of work is of superior quality and exceeds specific guidelines in one or more ways. Work and discussion posts exceed expectations.

B+, B, B- (87 - 89 B+, 83 - 86 B, -80 – 82, B-) Indicates that the course work has met the requirements and was judged acceptable. Work and discussion posts meet expectations.

C+, C, C- (77 – 79 C+, 73-76 C, 70-72 C) indicates that the level of work did not adequately meet the requirements.

D+, D, D-, (69-67, 66-63, 62-60) F, (59-0) indicates that the level of work was unacceptable.

#### **How to use the Guiding Questions**

Each weekly discussion will be based on the required readings/viewings. Each weekly Discussion Board will begin with one or more questions, referred to as *Guiding Questions or GQ*. Discussions boards run week to week, once a week closes, posts cannot be made up. Please see the **Rubric for Asynchronous Discussion Participation**.

Please see the **Rubric for Asynchronous Discussion Participation**.

#### **Grading/Grade Points**

A, A- (95-100 A, 90-94 A-) Indicates that the level of work is of superior quality and exceeds specific guidelines in one or more ways. Work and discussion posts exceed expectations.

B+, B, B- (87 - 89 B+, 83 - 86 B, -80 – 82, B-) Indicates that the course work has met the requirements and was judged acceptable. Work and discussion posts meet expectations.  
C+, C, C- (77 – 79 C+, 73-76 C, 70-72 C) indicates that the level of work did not adequately meet the requirements. D+ 69-67 D 66-63 D- 62-60 F 59-0

Topics:

Week 1 - Module: The MakerSpace Movement

Week 2- Module: Young Makers & MakerSpaces

Week 3- Module: Makers and STEM

Week 4- Module: Bringing MakerSpace into the Classroom

### **Rubric for Asynchronous Discussion Participation**

#### **A Quality of Postings Indicator**

Asynchronous discussion enhances learning as participants share their ideas, perspectives, and experiences with the class. Participants develop and refine their thoughts through the writing process, plus broaden their classmates' understanding of the course content. Each weekly discussion is organized around the Guiding Questions, to which participants must respond. Participants will use the following feedback to improve the quality of their discussion contributions.

#### **Grading Discussion Board**

Discussion postings that meet all criteria for a grade level will receive the highest points possible at that level. Postings that meet mixed levels of criteria will receive a score within the point range of the appropriate levels.

#### **Rubric for Discussion Board**

There are four criteria, Posts throughout the week, Details in each post, The quality of the information in response to other's posts, and the Frequency of Weekly Discussion Posts. The highest amount of points that can be earned in one week, for a score of excellent, is a score of 10 points.

#### **What to Consider when posting:**

- Guiding Questions (GQ)
- Refer to at least two specific points, from the article or reading.
- Conveying new information
- Contrast earlier information learned in the course of new information (after week1).
- Convey information from the readings, videos, or podcasts, as it applies to your experiences.
- Consider the importance of the final post to the Discussion board
- Discussion at a \*critical level is not just facts from information gathering, but rather provides supporting evidence (see below).
  - Discussion at a critical level means discussing, for example, the following:
  - Opinion of the facts gathered or facts mentioned by others in the discussion group
  - Why the opinion is held

- What is wrong with the fact/s mentioned
- Are the points, facts, opinions, consistent and or inconsistent with the material presented so far.

Note: Participants will review readings/videos, by analyzing the content for information, what is interesting, and what is new, and what is considered the pros and cons of the information. Participants should justify their analysis, providing their own opinions, not just quote information. However, your opinion must be backed up by quoting from the readings/videos.

### **Weekly Assignment - Levels of Achievement**

\*Criteria

\*Proficient, Competent, Adequate, Unacceptable

### **Final Project – Due on or before the last day of class**

Participants are required to create a Final Project. The Final Project should address how the course content has influenced their thinking. The Final Project can be a tool to be used by you for professional purposes, a presentation, or an activity. It should be short, for example, no more than 20 slides, concise, and cite from course content. DO NOT provide an overview of the course content.

\*Format choices:

1. PowerPoint (Visual & Audio) might be useful if the intent is to share the information.
2. A Prezi (instead of a PowerPoint)
3. A Podcast may be useful to create a report, much like a newscast \*\*
4. Writing a 10-page double-spaced APA style paper. One page of the paper may include a Wordle.
5. Or use of any other application that you choose to create your Final Project.

\*\*Note: If a participant chooses to create a Podcast, a summary of the podcast and sources cited, using APA style guidelines is required.

### **College Policy Regarding Academic Honesty**

Integrity is essential to academic life. Consequently, students who enroll at Framingham State College agree to maintain high standards of academic honesty and scholarly practice. They shall be responsible for familiarizing themselves with the published policies and procedures regarding academic honesty. Refer to *FSU Graduate Catalog, Student Conduct section, page 7* at: <http://www.framingham.edu/graduate-and-continuing-education/documents/grad-catalog-0910.pdf>.

### **Research**

Additional supporting information can be researched at the Framingham State University Online Library. Just log on to you FSU My Campus account and go to the tab that says Library.

### **Academic Accommodations Policy**

Framingham State University offers equal opportunities to all qualified students, including those with disabilities and impairments. The University is committed to making reasonable accommodations as are necessary to ensure that its programs and activities do not discriminate, or have the effect of discriminating, on the basis of disability. Academic Support serves students with learning and psychiatric disabilities as well as students with visual, mobility and hearing impairments. For further information about this, please visit the website at: <https://www.framingham.edu/academics/center-for-academicsuccess-and-advising> or contact Ms. LaDonna Bridges, Director of Academic Support/Disability Services, in the Center for Academic Support and Advising (CASA) at 508-626-4906 or [lbridges@framingham.edu](mailto:lbridges@framingham.edu)

### **Copyright**

The course website may contain copyrighted materials that are used in compliance with U.S. Copyright Law. Under that law, materials may not be saved to your computer, revised, copied, or distributed without permission. They are to be used in support of instructional activity as part of this course only and shall be limited to the duration of the course, unless otherwise specified by the instructor or owner of the material.

**Note: Syllabus is subject to change with notice. Check Blackboard regularly for updates.**