



Castleton University

**Course Title: STEM in the Early Years: Engaging Children in Ongoing,
Hands-on Investigations
Summer, 2019**

This course is a component of the Vermont Early Childhood Educator's Institute at Castleton University, developed by the Vermont Higher-Education- Early Childhood Consortium. All courses are aligned with the Vermont Early Learning Standards (VELS) and the Vermont Guiding Principles for Full Participation of Each and Every Child. Both are central to a shared vision for young children in Vermont in the years from birth through Grade 3.

Brief Course Description: Educators will investigate ways STEM (Science, Technology, Engineering and Mathematics) provides opportunities for children to extend their natural curiosity while providing them with direct experiences with hands-on STEM learning materials, events and ideas imperative for later learning.

Faculty Name(s): Beth Peloquin, M.Ed.

Sponsoring Institution (s): Vermont Center for the Book

Number of Credits: 3

Level: (graduate/undergraduate),

Age focus: **PreK and Kindergarten**

Design focus: **Early Childhood and Elementary (K-3) Educators**

Start Date:

Intensive Sessions: July 22- 25, 2019 on the campus of Castleton University

Final Projects/Papers Due: October 22, 2019

Format: Hybrid Course, face to face intensives are on the Castleton Campus

Learning Management System: Moodle

Instructor(s) Information

Full Name: Beth C. Peloquin, M.Ed

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Detailed Course Description: In this course participants will discuss and investigate concrete ways STEM (Science, Technology, Engineering and Mathematics) provides opportunities for PreK-K children to extend their natural curiosity while providing them with direct experiences with hands-on STEM learning materials, events and ideas imperative for later learning. Participants will engage in interactive hands-on activities as they increase their understanding of STEM content with an emphasis. Topics for discussion, exploration and implementation include: What is STEM for Young Children?; Vermont Early Learning Standards; Importance of adult guidance and structure; Preparing for STEM explorations; Science as a process (scientific inquiry); Using picture books; STEM environments and materials in the classroom; Web resources; Conducting Action Research; Documentation Panels for observing and assessing children's work; STEM with families.

Course Goals:

- Educators will learn how to encourage and nurture children's natural curiosity about the world around them through STEM inquiry and explorations.
- Educators will learn how to intentionally incorporate the language, concepts and skills of STEM into their daily interactions with children.

VELS Alignment :

Learning About the World

Mathematics : Number sense and quantity, counting and cardinality, measurement and classification

Science : Physical sciences, Engineering design

Guiding Principles Alignment :

Outcome B : Acquisition and Use of Knowledge and Skills (showing curiosity and initiative; exploring multiple environments; showing persistence; following through with plans; problem-solving in a variety of ways; communicating and reasoning; demonstrating age-appropriate concept development; exploring materials, representing ideas and stories through pictures and play; building and using vocabulary)

Outcome C : Taking Appropriate Action to Meet Needs (using objects as tools to make things happen; demonstrating self-confidence; communicating in a variety of ways)

Course Objectives:

Educators will gain knowledge and experience about how to:

- Select materials and STEM content for STEM opportunities that are developmentally appropriate and can be explored from multiple perspectives, in depth, and over time, building on children’s curiosity and prior experiences
- Use STEM practices by asking questions and fostering children’s questioning, guiding discussions, encouraging new ideas and aiding in data collection and children’s representations (drawings, etc.)
- Recognize and guide children’s development of other important skills included in the VELs, including working with one another, basic large- and small-motor control, language, and early mathematical understanding while doing science
- Align planning and implementation with VELs with an understanding of recent research and ideas that influence children’s science capabilities and learning
- Develop Documentation Panels for discussions and reflections about STEM explorations using text, video, photographs and children’s work as part of observing and assessing children’s thinking and skills
- Reflect on STEM interactions with children through writings, photos and other representations (in journal and template provided by instructor)
- Provide information and opportunities for families to participate in their child’s STEM learning experiences

Required Readings/Texts:

- *Worms, Shadows and Whirlpools: Science in the Early Childhood Classroom* by Karen Worth and Sharon Grollman

Other Suggested Readings/Texts:

- Handouts and suggested websites for reference and projects (provided by instructor)
- “Early STEM Matters: Providing High-Quality STEM Experiences for All Young Learners”: University of Chicago STEM Education and Erikson Institute, January 2017 (online; link provided by instructor)

Assignments:

Identify and design investigation of an Action Research topic/question

Projects:

Action Research

Written journal (journal and template provided).

Expectations:

Students will be required to keep a written journal (journal and template provided). Students will be required to identify and investigate an Action Research topic/question and document their investigations.

Evaluation:

Class participation – 40%

Action Research Project – 60%

Castleton Expectations:

Attendance for four days’ course instruction

In-class participation

Completion of assignments and projects in a timely manner

Grading Policy:

Grades are indicated by letters with a designated “quality point” value assigned to each as follows:

A 4.0

A-	3.7
B+	3.3
B	3.0
B-	2.7
C+	2.3

Additional grading information can be found in the 2018/2019 Castleton University Graduate Catalog, under Academic Policies, accessible online at: <http://catalog.castleton.edu/content.php?catoid=13&navoid=757>

Academic Honesty Policy:

Castleton University is a learning institution committed to the highest standards of scholarly conduct. The students, faculty, and administration make up a scholarly community whose integrity and success necessarily stem from a mutually agreed upon code of academic standards and principles that promote trust and honesty and prohibit the attempt to gain unfair academic advantage. Membership in the Castleton community means sharing responsibility for upholding and safeguarding these academic standards and principles.

Any violation of academic honesty will be considered cheating and will be dealt with accordingly by the appropriate authorities.

For more information click the link below to access the 2017/2018 Castleton University Graduate Catalog Academic Policy section:

http://catalog.castleton.edu/content.php?catoid=14&navoid=1020#Academic_Honesty

Use and Ownership of Copyrighted Materials:

For information and guidance, faculty and students are referred to the Vermont State College Manual of Policy and Procedures as it relates to the use and ownership of copyrighted materials. Guidelines are set out in Policy 416, accessible online at the following address:

<http://www.castleton.edu/library/information-literacy-graduation-standard/information-literacy-tutorial/information-ethics-citing-sources-and-fair-use/>

Additional information on this subject is contained in the publication “Questions and Answers on Copyright for the Campus Community.” This document can be accessed online on the National Association of College Stores web site at the following address:

<http://www.nacs.org/toolsresources/cmip/copyright/questions.aspx>.

Course Drop Policy:

Castleton University offers courses to educators with the expectation participants will complete the course. However, the University realizes circumstances arise in one’s personal life that may cause disruptions. The policy for dropping a Summer Institute course is that a participant will notify the instructor in writing of the intent to withdraw from the course.

The notice should include the reason for withdrawing and be made as follows:

3 credit course (45 hours) – before 9 hours of the course have taken place

After that, changes in class status will be considered for health, bereavement, and personal or emergency situations only. Those who withdraw without adhering to this policy may be liable for associated course costs.

For more Academic Policy information check the link below to access the 2017/2018 Castleton University Graduate Catalog:

<http://catalog.castleton.edu/content.php?catoid=13&navoid=757>.

Transcript Request:

<http://www.castleton.edu/campus-life/student-resources/student-services-center/transcript-request/>.