

COURSE NUMBER, TITLE and CREDITS

EDIU 9680 STEAM to Support Innovation & Creativity Across the Curriculum 3.0 credits

INSTRUCTOR INFORMATION

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BULLETIN COURSE DESCRIPTION

STEAM is an educational approach to learning that uses Science, Technology, Engineering, the Arts and Mathematics as access points for guiding student inquiry, dialogue, and critical thinking. The end results are students who take thoughtful risks, engage in experiential learning, persist in problem-solving, embrace collaboration, and work through the creative process. These are the innovators, educators, leaders, and learners of the 21st century!

PREREQUISITES: None

RESTRICTIONS: None

ESSENTIAL EQUIPMENT AND FACILITIES

- A computer with reliable Internet access and appropriate system and software to support the Blackboard learning platform.
- Also requires Word, PowerPoint, Excel, and Adobe Acrobat Reader.

COURSE LEARNING OBJECTIVES

By the end of the course the student should be able to:

- Understand and apply the current research related to integrating the arts into STEM (from STEM to STEAM) curriculum as a tool for developing critical thinkers and problem solvers
- Develop a plan for differentiating instruction and to guide student inquiry, dialogue, and critical thinking
- Promote inclusion of the Arts across the curriculum with Science, Technology, Engineering, and Math (STEAM)

MAJOR STUDY UNITS

- STEAM is an integrated approach to learning which requires an intentional connection between standards, assessments and lesson design/implementation
- True STEAM experiences involve two or more standards from Science, Technology, Engineering, Math and the Arts to be taught AND assessed in and through each other
- Inquiry, collaboration, and an emphasis on process-based learning are at the heart of the STEAM approach
- Utilizing and leveraging the integrity of the arts themselves is essential to an authentic STEAM initiative

INSTRUCTIONAL STRATEGIES

The course syllabus is designed so that you can work independently within a given time period. You will have ***three months from the date you register to complete the coursework***. If you have an emergency and need an extension, please email your instructor or program manager.

CLASS COMMUNICATION

Class Communication will take place using the Brandman email system.

RECOMMENDED TEXT

You have many choices for reading from this list of resources. The list below represents just a few of the many excellent books on the subject of integrating the arts into the STEM curriculum – from STEM to STEAM. You may choose another but please email me for approval prior to reading a book not on the recommended list:

Cofield, Jacqueline (August 2017) *STEAM+ Arts Integration Anthology: Insights and Practical Applications*. CreateSpace Independent Publishing Platform.

Maslyk, Jacie (March 2016) *STEAM Makers: Fostering Creativity and Innovation in the Elementary Classroom*. Corwin Publishing.

Pollman, Mary Jo (September 2017) *The Young Artist as Scientist: What Can Leonardo Teach Us?* Teachers College Press.

Riley, Susan M. (December 2012) *STEAM Point: A Guide to Integrating Science, Technology, Engineering, the Arts, and Mathematics through the Common Core*. CreateSpace Independent Publishing Platform.

Riley, Susan M. (April 2014) *No Permission Required: Bringing STEAM to Life in K-12 Schools*. Visionyst Press.

Sousa, David A & Thomas J. Pilecki. (March 2018) *From STEM to STEAM: Brain-Compatible Strategies and Lessons that Integrate the Arts* (second edition). Corwin Publishing.

The STEAM Journal: Science, Technology, Arts, and Math
<https://scholarship.claremont.edu/steam/>

STUDENT PERFORMANCE REQUIREMENTS

This three-unit course will require you to ***log a minimum of 45 hours of work for successful completion***. You will also be ***required to read a minimum of 300 pages from books/professional journals/Internet articles*** that will help inform your knowledge of STEAM instruction.

This course requires completion of five assignments. Each assignment will be explained in detail.

ASSIGNMENT PRODUCT
1. Professional Reading and Review: Completed Reading Blog
2. Internet Research Bibliography: Completed Table & 2-3 page Narrative
3. Projects and Activities: Completed Lesson Plan & Project examples
4. Annotated Time Log: Completed Form
5. Final Course Reflections: Completed Reflection Form

Assignment #1: Professional Reading and Review Blog

Read at least 300 pages of one or more books or other resources related to STEAM research. Summarize the reading experience by addressing how your readings helped you reach your goals, how the readings informed your teaching experience, and why you would or would not recommend the readings to a colleague.

Assignment #2: Internet Research

Using the Internet, **research and document 8 reliable websites that promote the arts in STEAM education in the classroom.** Based on your research and your own personal experience, **write a 2-3 page narrative supporting the integration of the arts in STEAM education into your curriculum.**

Assignment #3: Lesson Plan

Using a lesson planning format, **create three lessons that integrate the arts into STEAM curriculum** using knowledge gained through professional reading and research, interviews with other teachers, and curriculum standards for your grade level or subject area. **Provide examples for each lesson.**

Assignment #4: Annotated Time Log

Complete a time log that includes the date, time spent, the activities you completed during this time and your reflections on the time spent. **You must include a total of at least 45 hours. You may not include time spent in class teaching the lessons** in your Annotated Time Log.

Assignment #5: End of Course Reflections

Reflect on the course as a whole. Consider whether you accomplished what you set out to accomplish, what you learned that you can use as an educator, how your learning affected your thinking or practice, and what other information you would like to learn.

METHODS OF EVALUATION FOR DETERMINING GRADES

Grades are determined on a straight-scale basis using the following scale:

Deliverable	Points
Assignment #1: Professional Reading and Review Blog	20
Assignment #2: Internet Research	25
Assignment #3: Lesson Plan	25
Assignment #4: Annotated Time Log	10
Assignment #5: End of Course Reflections	20
TOTAL	100

A = 90 - 100 points

B = 80 – 89 points

C = 70 - 79 points

D = 60 - 69 points

SUBMITTING INDIVIDUAL AND TEAM ASSIGNMENTS

All assignments must be successfully uploaded from the Review and Complete Assignments link for the corresponding assignment. Assignments are not accepted via e-mail.

BRANDMAN UNIVERSITY ACADEMIC WRITING STANDARDS

Specific writing standards differ from discipline to discipline, and learning to write persuasively in any genre is a complex process, both individual and social, that takes place over time with continued practice and guidance. Nonetheless, Brandman University has identified some common assumptions and practices that apply to most academic writing done at the university level. These generally understood elements are articulated here to help students see how they can best express their ideas effectively, regardless of their discipline or any particular writing assignment.

Venues for writing include the widespread use of e-mail, electronic chat spaces and interactive blackboards. Brandman University is committed to guaranteeing that students can expect all electronic communication to meet Federal and State regulations concerning harassment or other “hate” speech. Individual integrity and social decency require common courtesies and a mutual understanding that writing--in all its educational configurations--is an attempt to share information, knowledge, opinions and insights in fruitful ways.

Academic writing (as commonly understood in the university) *always* aims at correct Standard English grammar, punctuation, and spelling.

The following details are meant to give students accurate, useful, and practical assistance for writing across the curriculum of Brandman University .

Students can assume that successful collegiate writing will generally:

- Delineate the relationships among writer, purpose and audience by means of a clear focus (thesis statements, hypotheses or instructor-posed questions are examples of such focusing methods, but are by no means the only ones) and a topic that's managed and developed appropriately for the specific task.
- Display a familiarity with and understanding of the particular discourse styles of the discipline and/or particular assignment.
- Demonstrate the analytical skills of the writer rather than just repeating what others have said by summarizing or paraphrasing
- Substantiate abstractions, judgments, and assertions with evidence specifically applicable for the occasion whether illustrations, quotations, or relevant data.
- Draw upon contextualized research whenever necessary, properly acknowledging the explicit work or intellectual property of others.
- Require more than one carefully proofread and *documented* draft, typed or computer printed unless otherwise specified.

DOCUMENTATION

Any material not original to the student must be cited in a recognized documentation format (APA, ASA, MLA or Chicago-style) appropriate to the particular academic discipline. Deliberate use of information or material from outside sources without proper citation is considered plagiarism and can be grounds for disciplinary action. See the explanation of Academic Integrity below.

ACADEMIC INTEGRITY

As a learning community of scholars, Brandman University emphasizes the ethical responsibility of all its members to seek knowledge honestly and in good faith. Students are responsible for doing their own work, and academic dishonesty of any kind will not be tolerated. "Violations of academic integrity include, but are not limited to, cheating, plagiarism, or misrepresentation of information in oral or written form. Such violations will be dealt with severely by the instructor, the dean/center director, and the standards committee. Plagiarism means presenting someone else's idea or writing as if it were your own. If you use someone else's idea or writing, be sure the source is clearly documented." Other guidelines for acceptable student behavior are specified in the *Brandman University Catalog*.

AMERICANS WITH DISABILITIES ACT STATEMENT

Any personal learning accommodations that may be needed by a student covered by the "Americans with Disabilities Act" must be made known to the Campus Director or Advisor as soon as possible. **This is the student's responsibility.** Information about services, academic modifications and documentation requirements can be obtained from the Director of a Brandman University campus.

ADDITIONAL RESOURCES

Suggested resources listed in bibliography but not required

WEBSITES

Cassie Quigley, Dani Herro, & Faiza Jamil. (Feb 2017) Developing a Conceptual Model of STEAM Teaching Practices. *School Science & Mathematics*
<https://onlinelibrary.wiley.com/doi/abs/10.1111/ssm.12201>

Education Closet. "What is STEAM?" <https://educationcloset.com/steam/what-is-steam/>

The STEAM Journal: Science, Technology, Arts, and Math
<https://scholarship.claremont.edu/steam/>

STEAM Education. <https://steamedu.com>

25 STEAM Projects for Kids: <https://babbledabbledo.com/25-steam-projects-for-kids/>

Grades K-12: <http://www.nea.org/tools/lessons/Arts-Across-the-Curriculum.html>