University of North Texas at Dallas
Summer I 2014
SYLLABUS

STEM Literacy Across the Disciplines/3Hrs

Department of	**Teacher Education and Administration**	**Division of**	**Education and Human Services**

Instructor Name:	**Dr. Paula Mason**
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Office Hours:	By Appointment
Virtual Office Hours:	*Email anytime*

Classroom Location:	**Online**
Class Meeting Days & Times:	**Online**

Course Catalog Description:	This course is designed to help teachers in all content areas integrate science, technology, engineering, and math into their curriculum to promote STEM literacy for all. The major emphasis will be on practical application of the course content to the classroom setting. Because of the link between traditional literacy and STEM literacy, attention will also be given to using reading strategies in the various content areas to promote thinking and learning.

Prerequisites:	n/a
Co-requisites:	n/a

Required Text: **Required Materials:**	Vaquez, J. A., Sneider, C. & Comer, M. (2013) *STEM Lesson Essentials, Grades 3-8*

Recommended Text and References:	

Access to Learning Resources:	UNT Dallas Library: phone: (972) 780-3625; web: http://www.unt.edu/unt-dallas/library.htm UNT Dallas Bookstore: phone: (972) 780-3652; e-mail: 1012mgr@fheg.follett.com

Course Goals or Overview:	
	STEM literacy is an interdisciplinary area of study that bridges the four areas of science, technology, engineering and mathematics. STEM literacy does not simply mean achieving literacy in the individual strands. STEM literacy means understanding the world in a logical way guided by the principals of scientific thought. A STEM-literate person can think for themselves, ask critical questions, form hypotheses and seek data to confirm or deny them.

Learning Objectives/Outcomes:	At the end of this course, the student should be able to:
1	1. Determine the nature and goals of STEM literacy, evaluate and critique levels of STEM literacy in themselves and their students.

2	2. Distinguish the guiding principles for effective STEM instruction and create lessons using these principles.
3	3. Demonstrate how to integrate STEM across all disciplines.
4	4. Evaluate the needs of students and prioritize them with the goals of the teacher and the curricular demands of subject areas;
5	5. Design reading and literacy instruction in the content areas that will enable all students to reach educational goals and achievements.

COURSE TOPICS

STEM Literacy

Guiding Principles for Effective STEM Instruction

Integrating STEM into the Classroom

Developing STEM Lessons

Implementation

Course Outline

Week 1—June 2- June 8, 2014

Topic: "What is It?"
Read Chapters 1-3 from STEM Lesson Essentials
Handouts/Articles: Engineering Design Process (http://www.sciencebuddies.org/engineering-design-process/engineering-design-process-steps.shtml#theengineeringdesignprocess); "Advancing STEM Education: A 2020 Vision."; "Learning for STEM Literacy: STEM Literacy for Learning."

Article Reference in APA format:
Bybee, R. W. (2010). Advancing STEM education: A 2020 vision. *Technology and Engineering Teacher*, *70*(1), 30-35.
Zollman, A. (2012). Learning for STEM literacy: STEM literacy for learning. *School Science and Mathematics*, 112(1), 12-19.

Discussion Question 1 DUE June 5, 2014. Discussion Question 2 DUE June 7, 2014.:
Blackboard Discussion Question 1: Evaluate and critique you and your students' level of STEM literacy. What do you think STEM literate teachers and students should know and be able to do? (3 pts.)

Blackboard Discussion Question 2: Which of the Guiding Principles do you already use in your own teaching? How? Which could you use in the future? (3 pts.)
Assignments DUE June 8, 2014 by 11:59 p.m.:
Reflection on Readings (250 words minimum): Key quotes and your critical thoughts on the quotes (3 pts.)

Create a graphic organizer for each chapter to summarize the salient points in the text. (6 pts.)

Participation: Post a total of eight substantive messages each week in Blackboard. The eight messages must occur on at least three different days during the online week to earn full credit. (2 pt.)

Learning Objectives 1

Week 2- June 9- June 15, 2014

Topic: "Guiding Principles & STEM Practices in the Classroom"
Read Chapters 4-6 from STEM Lesson Essentials

Videos: STEM Design Challenge: Edible Cars (TCH) https://www.teachingchannel.org/videos/engineering-design-process-stem-lesson ; **Collaborating to Design and Build Stable Structures (TCH)** https://www.teachingchannel.org/videos/bridge-building-lesson-plan

Discussion Question 1 DUE June 12, 2014. Discussion Question 2 DUE June 14, 2014.:
Blackboard Discussion Question 1: What key steps did the teacher take to help students succeed in her STEM lesson in Chapter 4? How can these steps be applied in your classroom? (3 pts.)

Blackboard Discussion Question 2: Discuss what you noticed and/or wondered about the two videos for this week. What ideas can you use in a lesson in your classroom? How? (3 pts.)

Assignments DUE June 15, 2014 by 11:59 p.m.:
Reflection on Readings (250 words minimum): Key quotes and your critical thoughts on the quotes (3 pts.)

Create a graphic organizer for each chapter to summarize the salient points in the text. (6 pts.)

Participation: Post a total of eight substantive messages each week in Blackboard. The eight messages must occur on at least three different days during the online week to earn full credit. (2 pt.)

Learning Objectives 2 & 3

Week 3 June 16- June 22, 2014

Topic: "Integration & What it Looks Like"
Read Chapters 7-11 from STEM Lesson Essentials

Discussion Question 1 DUE June 19, 2014. Discussion Question 2 DUE June 21, 2014.:
Blackboard Discussion Question 1: Which of the three approaches for integrated curriculum units do you think would be most helpful for a specific purpose in your classroom? Why? (3 pts.)

Blackboard Discussion Question 2: Think back over your life's experiences as a student or as a teacher. Discuss some examples of multidisciplinary, interdisciplinary, and/or transdisciplinary teaching? (3 pts.)

Assignments DUE June 22, 2014 by 11:59 p.m.:
Reflection on Readings (250 words minimum): Key quotes and your critical thoughts on the quotes (3 pts.)

Participation: Post a total of eight substantive messages each week in Blackboard. The eight messages must occur on at least three different days during the online week to earn full credit. (2 pt.)

Learning Objectives 2 & 4

Week 4 June 23- June 29, 2014

Topic: Developing STEM Lessons
Read Chapters 12-14 from STEM Lesson Essentials

Discussion Question 1 DUE June 26, 2014. Discussion Question 2 DUE June 28, 2014.:
Blackboard Discussion Question 1: If you were talking with a fellow colleague, how would you explain what a STEM PBL unit (project-based learning) is all about? What is the difference between the PBLs (project-based learning) described in the textbook and the PBLs (problem-based learning) conducted in Lancaster ISD? (3 pts.)

Blackboard Discussion Question 2: Think of your own assessment habits. Which of the tools in chapter 13 do you use and how is it effective? How might you make use of a different tool for your next assessment task? (3 pts.)

Assignments DUE June 29, 2014 by 11:59 p.m.:
Reflection on Readings (250 words minimum): Key quotes and your critical thoughts on the quotes (3 pts.)
Create a graphic organizer for each chapter to summarize the salient points in the text. (6 pts.)

Participation: Post a total of eight substantive messages each week in Blackboard. The eight messages must occur on at least three different days during the online week to earn full credit. (2 pt.)

Learning Objectives 2, 3, & 4

Week 5 June 30- July 3

Topic: "Implementation"
Read Chapters 15-17 from STEM Lesson Essentials
Handouts: STEM Lesson Template

Videos: Literacy Partners in the Science Classroom (TCH) https://www.teachingchannel.org/videos/pairing-students-in-classroom ; **Literacy in Physics (TCH)** https://www.teachingchannel.org/videos/ccss-literacy-science-classroom

Discussion Question 1 DUE June 30, 2014. Discussion Question 2 DUE July 2, 2014.:
Blackboard Discussion Question 1: What do you think about the guiding principle: Some STEM for ALL and ALL STEM for some? (3 pts.)

Blackboard Discussion Question 2: What strategies do you use to help students comprehend the content area textbook? How are these strategies effective in your class? (3 pts.)

Assignments DUE July 3, 2014 by 11:59 p.m.:
Make a list of 8-10 reading strategies you could use to help students comprehend your content area text and explain how to use the strategies. (10 pts.)

Culminating Project: Create a STEM lesson for your content area. (20 pts.)

Participation: Post a total of eight substantive messages each week in Blackboard. The eight messages must occur on at least three different days during the online week to earn full credit. (2 pt.)

Learning Objectives 2, 3, 4 & 5

COURSE EVALUATION METHODS

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course:

Critical reading and response
Written reflections
Collaborative learning
Critical dialogue on Discussion Board
STEM Lesson plan
Reading Strategy List

GRADING MATRIX

Instrument	Weight	Notes
Discussion Questions	30 pts.	Two questions per week; 3 pts. each

(Weeks 1-5)		
Reflection on Readings (Weeks 1-4)	**12 pts.**	**3 points each**
Graphic Organizers (Weeks 1, 2, 4)	**18 pts.**	**6 points each**
Participation (Weeks 1-5)	**10 pts.**	**2 points each**
Reading Strategies Week 5	**10 pts.**	**Final Project**
STEM Lesson Plan Week 5	**20 pts.**	**Final Project**
TOTAL:	**100 pts.**	

Base Grade Determination:
A = 90 – 100 pts.
B = 80 – 89 pts.
C = 70 – 79 pts.
D = 60 – 69 pts.
F = less than 60 pts.

Instructor's Policies and Procedures

Participation Requirements:
For full participation credit, you are required to respond to at least 3 classmates' posts each week on Blackboard. This makes a total of 6 responses to classmates per week and 2 initial Discussion Question responses.

Participation posts, as required by the syllabus, should be substantive in nature. For this class, substantive means that your message has substance and helps to further the discussion of course content. Substantive messages will often include contributions of additional ideas and sources, insights or questions about classmates' comments, connections to the course readings, ways of applying the lessons from the course, etc. As a rule of thumb, your substantive comments should be at least several sentences in length.

Short comments, such as "Good idea" or "I agree," do not constitute substantive posts on their own. Neither do comments that are unrelated to the topics at hand (for example, "I saw that movie, too!") If you say you agree about something, please explain why you agree, and add an additional insight or question.

University Policies and Procedures

Students with Disabilities (ADA Compliance):
The University of North Texas Dallas faculty is committed to complying with the Americans with Disabilities Act (ADA). Students' with documented disabilities are responsible for informing faculty of their needs for reasonable accommodations and providing written authorized documentation. Grades assigned before an accommodation is provided will not be changed as accommodations are not retroactive. For more information, you may visit the Student Life Office, Suite 200, Building 2, or call Laura Smith at 972-780-3632.

Student Evaluation of Teaching Effectiveness Policy:

The Student Evaluation of Teaching Effectiveness (SETE) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider the SETE to be an important part of your participation in this class.

Assignment Policy: All assignments must be completed to pass the course.
Late Assignments: All assignments are due by 11:59 p.m. on the day they are due. Late assignments receive a 10% deduction for each day they are late if assignments are not posted by 11:59 p.m. on the day they are due. Assignments more than 3 days late will not be accepted. Technological issues are not considered valid grounds for late assignment submission. In the event of a University of North Texas at Dallas server outage, students should submit assignments to me via email and when systems are restored, submit those assignments through Blackboard. Unless an Incomplete grade has been granted, learner assignments submitted after the last day of class will not be accepted. Incompletes will only be granted for extenuating circumstances, such as illness.

Exam Policy:
Exams should be taken as scheduled. No makeup examinations will be allowed except for documented emergencies (See Student Handbook).

Academic Integrity:
Academic integrity is a hallmark of higher education. You are expected to abide by the University's code of Academic Integrity policy. Any person suspected of academic dishonesty (i.e., cheating or plagiarism) will be handled in accordance with the University's policies and procedures. Refer to the Student Code of Academic Integrity at http://www.unt.edu/unt-dallas/policies/Chapter%2007%20Student%20Affairs,%20Education,%20and%20Funding/7.002%20Code%20of%20Academic_Integrity.pdf for complete provisions of this code.
In addition, all academic work submitted for this class, including exams, papers, and written assignments should include the following statement:
On my honor, I have not given, nor received, nor witnessed any unauthorized assistance that violates the UNTD Academic Integrity Policy.

Bad Weather Policy:
On those days that present severe weather and driving conditions, a decision may be made to close the campus. In case of inclement weather, call UNT Dallas Campuses main voicemail number (972) 780-3600 or search postings on the campus website www.unt.edu/dallas. Students are encouraged to update their Eagle Alert contact information, so they will receive this information automatically.

Attendance and Participation Policy (Face to Face Courses):
The University attendance policy is in effect for this course. Class attendance and participation is expected because the class is designed as a shared learning experience and because essential information not in the textbook will be discussed in class. The dynamic and intensive nature of this course makes it impossible for students to make-up or to receive credit for missed classes. Attendance and participation in all class meetings is essential to the integration of course material and your ability to demonstrate proficiency. Students are responsible to notify the instructor if they are missing class and for what reason. Students are also responsible to make up any work covered in class. It is recommended that each student coordinate with a student colleague to obtain a copy of the class notes, if they are absent.

Diversity/Tolerance Policy:
Students are encouraged to contribute their perspectives and insights to class discussions. However, offensive & inappropriate language (swearing) and remarks offensive to others of particular nationalities, ethnic groups, sexual preferences, religious groups, genders, or other ascribed statuses will not be tolerated. Disruptions which violate the Code of Student Conduct will be referred to the Office of Student Life as the instructor deems appropriate.