EDUC 5389: Interdisciplinary Methods
Spring 2022

Instructor: Joseph Ferrara, Ed.D.

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(The best way to contact me is through cell. Outside of office hours you can text me first.)
Office Hours: MWF 4:00pm-5:30 pm. During office hours I can be reached by phone or we can set up a Zoom/Google meet. Additional availability by appointment.

Course Overview:
Science, Technology, Engineering, and Mathematics (STEM) Education is by definition interdisciplinary. This course will explore how K-12 teachers can best integrate multiple disciplinary concepts within their STEM and Non-STEM classrooms. Interdisciplinary methods related to STEM; STEM with Fine Arts; STEM with Language Arts; and STEM with Social Studies will be addressed in this course.

Student Learning Outcomes:

1) The student will be able to discuss, critique, and reflect on the research and experiences related to interdisciplinary methods in STEM education. *Texas Educator Standards:* (1ai, 1aii, 1aiii, 1bi, 1biii and 1cii; 2ai, 2bi, 2bii, 2biii, and 2ciii; 3ai, 3aii, 3aiii, 3bi, 3bii, 3biii, 3ci, 3cii, and 3ciii; 5ai; 6ai) *INTASC Standards:* (1, 2, 4, 5, 7, and 8)
2) The student will be able to prepare, implement, and reflect on instructional lesson planning regarding interdisciplinary methods in STEM education. *Texas Educator Standards:* (1ai, 1aiii, 1bi, and 1cii; 2bi, 2ciii) *INTASC Standards:* (1, 2, and 7)
3) The student will be able to synthesize personal perspectives and research literature as it relates to interdisciplinary methods in STEM education. *Texas Educator Standards:* (1bii 1biii, 1ci; 2bi, 2bii, 2biii, and 2ciii; 3ai, 3aii, 3aiii, 3bi, 3bii, 3biii,3ci, 3cii, and 3ciii) *INTASC Standards:* (1,2,4,5 and 8)

Success in this Course
Successfully meeting the learning outcomes listed above will require a great deal of introspection as you engage with the course content through the lens of your own pedagogical perspectives and experiences. We will begin with a survey of STEM research and the various methodologies associated with it. This will provide a lens for us to use as we dive deeper into disciplinarity to see how it is manifested in the lesson plans of different fields of study. Lastly, you will demonstrate your understanding by designing a unit of

your own that integrates STEM and the methodologies covered in the course. Fully engaging in all course discussions, readings, analysis, and projects will result in your success.

Required Textbooks and Readings:

All required readings will be provided to you through Canvas as a downloadable file or link.

Assignments and weights/point values

1. Discussion Posts 10%
2. Video Discussion Posts 15%
3. Research/Reading Analysis 25%
4. Projects 45%
    a. Unit Analysis (15%)
    b. Final Interdisciplinary Unit (30%)
5. Class Participation and Professionalism 5%

Grading Scale:

A	93% or greater
B	83 – 92%
C	73 – 82%
D	63 – 72%
F	below 63%

Course Policies (attendance, assignments, Late Work.)

Attendance

Attendance will be based on weekly participation in class discussion posts and will be reflected in the Class Participation and Professionalism portion of your grade. We will follow the UT Tyler Class Attendance policy found in the catalog.

Assignment Flow

All new assignments will be posted in a new Module on Sunday nights by 11:59pm unless otherwise stated. All module assignments are due the Sunday after that Module was posted by 11:59pm (1 Week) unless otherwise noted in the Module.

Assignment Submission

All assignments will be submitted through Canvas in the format required by the assignment posting. No email attachments of assignments will be accepted. Should you have any issues submitting, please let me know as soon as possible.

Late Work

All assignments are due on or before the dates provided in each Canvas Module unless otherwise noted in the posting. Submission deadlines are final and links will be removed after deadline has expired. NO LATE assignments will be accepted unless a valid pre-approved or medical reason has been discussed with the professor. If an assignment is not completed on time due to a documented illness, funeral, or other university related activity, then a make-up date can be scheduled with me. **All late assignments or non-submitted assignments without approval will receive a score of zero points**. Special circumstances will be reviewed on a case by case basis. I will do my best to work with you to successfully complete the course.

.**Calendar of Topics, Readings, and Due Dates**

Below is a tentative outline of the course. The direction will change in order to provide the most relevant experiences and resources based on the make-up of our class. All changes will be annotated in the Canvas Calendar as well as in each Module. Students will also be notified through course announcements.

Class Topic	***Readings/Videos***	***Discussion***	***Assignment/s***	***Notes***
Jan 10-16 Module 1: Getting Started				
STEM Overview	*Syllabus; STEM Education; International STEM Education; NAP-STEM Education*	*Introductions; Post responses to reading prompts*	*Video Bio-sketch*	*You will create a video and upload.*
Jan 16-23 Module 2				
Framing STEM Education	*Video: STEM Education; Rising Above the Gathering Storm*	*Integrated STEM Challenges*	*Writing Prompt Assignment – Response to STEM Education*	
Jan 23-30 Module 3				
STEM Curriculum Research	*Survey of STEM Curriculum,*	*Typical Mathematics Teaching*	*Research/Review of subject specific STEM integration Curriculum*	
Jan 30- Feb 6 Module 4				
STEM as a Meta-Discipline	*Videos – Teaching Evaluation US and Japan; Efficacy Beliefs, Problem Posing and Mathematics Achievement; TIMMS Videos*	*Post responses to reading/video prompts*	*Video Response: Clinical Teacher Observation Rubric*	*You will create a video and upload.*
Feb 6-13 Module 5				
Disciplinarity	• *Disciplinarity: An Introduction;* • *Defining and Teaching Interdisciplinary Studies;*	*Post responses to reading/video prompts*	*Writing Assignment: Personal Unit Evaluation*	

	• *There's Madness in These Methods: Teaching Secondary Methods Students to Develop Interdisciplinary*			
Feb 13-20 Module 6				
Interdisciplinary Methods and Curricula - PBL	*Using Informational Texts During Social Studies; Nonfiction and Interdisciplinary Inquiry: Multimodal Learning in English and Biology; Videos: PBL Explained*	*Post responses to reading/video prompts; Identifying Connections Between Disciplines; Integrated STEM to Improve Outcomes*	*Writing Assignment: Personal Unit Evaluation*	
Feb 20-27 Module 7				
Designing Interdisciplinary Units: Project Mapping	*Videos: Rigorous Project-based Learning; PBL Project Planning Lecture; Designing Curriculum Units Guide*	*Framework for Developing Integrated STEM Education; Building STEM Interest*	*Complete draft templates outlining projects*	
Feb 27-Mar 6 Module 8				
Designing Interdisciplinary Units: Project Mapping - continued	*Videos: Rigorous Project-based Learning; PBL Project Planning Lecture; Designing Curriculum Units Guide*	*Framework for Developing Integrated STEM Education; Project Support Forum*	*Complete draft templates outlining a project; Submit draft personal design template*	
Mar 7-12 SPRING BREAK				

Mar 13-20 Module 9				
Interdisciplinary Project cont.	• *Designing Curriculum Units Guide*	*Post Responses to Design Checklist; Project Support Forum*		
Mar 20-27 Module 10				
PBL Learning Scenarios	• *PBL Works;* • *Tips for project-based learning*	*PBL Works Discussion; Project Support Forum*		
Mar 27-Apr 3 Module 11				
Assessment	• *Effects of Problem-Based Learning: A Meta-Analysis from the Angle of Assessment*	*Project Support Forum*	*Draft Assessment Approaches for Unit*	*Mar 28 Last Day to Withdraw*
Apr 3-10 Module 12				
Lesson Plans	• *Inquiry-based Learning in the English Classroom (Website)* • *Resources and Tools for PBL Start to Finish*	*Post Responses to the tools and resources in readings; Project Support Forum*	*Draft Lesson Plans*	
Apr 10-17 Module 13				
Implementing Interdisciplinary Methods	• *Interdisciplinary Teaching with Students as Inventors;* • *Conflict Resolution in Team Teaching: A Case Study in*	*Respond to prompts on IDL Implications addressed in Readings; Project Support Forum*	*Writing Prompt: Potential Strategies for implementing IDL methods.*	

	Interdisciplinary Teaching; • *Back to Basics: Interdisciplinary Teaching Using School Gardens* • *Analysis of Teaching Resources for Implementing an Interdisciplinary Approach in the K-12 Classroom*			
Apr 17-24 Module 14				
Unit Evaluation	• *Designing Curriculum Units Guide*	*Project Support Forum*	*Video Submission of Unit Self Evaluation*	
Apr 24-30 Final Exam Week				
Takeaways		*Final Discussion Prompt – Video Submission*	*Upload final revised Project*	

Have a great semester!