I. Catalog Description (Credit Hours of Course):
Leadership principles and the roles and responsibilities of STEM Education specialists. Applications of models to examples. (3 credits)

II. Prerequisite(s):
Admission to the MNS in STEM Education and completion of ST603 Research Methods in STEM Education or permission of instructor.

III. Purpose or Objectives of Course:
The candidate will:
1) Identify the characteristics of leadership styles
2) Understand the roles, responsibilities, and purpose of STEM (Science, Technology, Engineering, Mathematics) leaders and their role in professional development.
3) Know current resources, such as professional organizations, that support learners in STEM education.
4) Develop approaches to support STEM educators in systematically reflecting and learning from practice.
5) Create a plan to promote effective communication and facilitate conflict resolution to aid in collaboration to create a shared vision for STEM.
6) Plan and develop professional development programs at the school (or institution) and district (or regional) levels.
7) Develop plans to use leadership skills and grant writing skills to improve STEM programs at the school (or institution) and district (or regional) levels through data-driven decision making. Projects may include some of the following
   - Develop appropriate classroom-or school-level learning environments
   - Build relationships with teachers, administrators, and the community
   - Collaborate to create a shared vision and develop an action plan for STEM improvement

IV. Student Learning Outcomes
Students will be able to:
1. Demonstrate understanding of the roles, responsibilities, and purpose of STEM leaders.
2. Create a plan to help others reflect and learn from their STEM practice.
3. Plan STEM professional development programs.
V. Optional departmental/college requirements:

None

VI. Course Content or Outline

<table>
<thead>
<tr>
<th>Topics</th>
<th>Tentative schedule in hours*</th>
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<tbody>
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<td>Leadership styles</td>
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<tr>
<td>Resources for STEM leaders</td>
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<tr>
<td>Learning from practice and working with adults</td>
<td>14</td>
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<tr>
<td>Planning and evaluating professional development activities</td>
<td>7</td>
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<tr>
<td>Using data-driven decision making</td>
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<tr>
<td>Developing a professional development program</td>
<td>5</td>
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<td>Exams and presentations</td>
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Please Attach copy of class syllabus and schedule as an example

Signature: ____________________________________________  Date:
__________________________________________________
Chair

Signature: ____________________________________________  Date:
__________________________________________________
Dean
ST650 Leadership in STEM Education
MNS Option in STEM Education
College of Science, Technology and Agriculture

Instructor contact information: TBA
Office hours and location: TBA

I. Catalog Description and Credit Hours
   Principles, roles and responsibilities of leadership in STEM education. Applications of models and theories to examples. (3 credits)

II. Pre or Co-Requisites
   Admission to the MNS option in STEM Education and completion of ST603 Research Methods in STEM Education or permission of instructor.

III. Purpose of Course:
   The purpose of this course is to prepare STEM (Science, Technology, Engineering, and Mathematics) educators to lead school, institution, or district based initiatives in STEM education from positions such as Title I Math supervisors, specialists in Regional Professional Development Centers, curriculum designers, chairs of math or science departments, STEM outreach coordinators, museum science educators, district STEM supervisors or STEM coordinators. Students will develop knowledge and understanding of leadership principles, of themselves as leaders, and of the roles and responsibilities of STEM leaders. Students will engage in multiple tasks that help them apply models and theories to specific examples.

   Course Objectives:

   The candidate will:
   8) Identify the characteristics of leadership styles
   9) Understand the roles, responsibilities, and purpose of STEM leaders and their role in professional development.
   10) Know current resources, such as professional organizations, that support learners in STEM education.
   11) Develop approaches to support STEM educators in systematically reflecting and learning from practice.
   12) Create a plan to promote effective communication and facilitate conflict resolution to aid in collaboration to create a shared vision for STEM.
   13) Plan and develop professional development programs at the school (or institution) and district (or regional) levels.
   14) Develop plans to use leadership skills and grant writing skills to improve STEM programs at the school (or institution) and district (or regional) levels through data-driven decision making. Projects may include some of the following

   ▪ Develop appropriate classroom-or school-level learning environments
• Build relationships with teachers, administrators, and the community
• Collaborate to create a shared vision and develop an action plan for STEM improvement

IV. Student Learning Outcomes

Students will be able to:
4. Demonstrate understanding of the roles, responsibilities, and purpose of STEM leaders.
5. Create a plan to help others reflect and learn from their STEM practice.
6. Plan STEM professional development programs.

V. Course Content Outline

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1) Leadership – Roles and Styles
   A. STEM specialists
      1. Need for STEM specialists
      2. Roles
      3. Research regarding effectiveness of leaders
   B. What is leadership?
   C. Leadership styles
      1. Descriptions of styles
      2. Assessment of self as leader
         a. Enhancing self-awareness and identity in relation to leadership

2) Helping others learn from practice
   A. Developing proficiency in teaching
      1. What does effective STEM teaching look like?
      2. Strands of STEM proficiency
      3. Teaching for STEM proficiency
      4. Knowledge base for teaching in STEM
   B. Working with Adult Learners
      1. Facilitating effective communication and conflict resolution
      2. Dealing with resistance
      3. Facilitating professional development
4. Working with teams
5. Mentoring and coaching: teaching people to reflect
6. Incorporating effective instructional strategies
7. Promoting proficient teaching of STEM

3) Data-driven decision making related to STEM
   A. Analyzing school and district data
   B. Evaluating and monitoring the effectiveness of a professional development activity or program
   C. Disseminating information to administrators, parents and community

4) Designing and Evaluating a Professional Development Plan for STEM
   A. Developing a school-wide professional development plan
   B. Developing a professional development experience
   C. Identifying sources of funding and grant opportunities for professional development

VI. Textbook / Resources:


   Note, glickman is very practical and useful in preparing teacher leaders


VII. Assessment of Learner Outcomes:

Leadership Analysis and Reflective Paper 15% of grade
Complete an analysis of yourself as a leader. Write a reflective paper that summarizes your leadership style, strengths, communication style, personality, and areas you need to further develop. Discuss how this analysis may inform your work as a STEM leader. Identify goals and action plans for your professional growth as a STEM leader.

Mentoring plan 10% of grade
Complete “Taking Stock of the Mentor’s Professional Development Needs”. Write a reflective paper that summarizes what you learned about yourself and the steps you plan to take to gain the knowledge or resources you need. Use one of the areas from this assessment and create a plan for how you could mentor either a beginning or experienced teacher in this area.
School/District Assessment and Analysis 25% of grade
Complete an assessment of the STEM education program in your school or district. You may choose one component of STEM as a focus. What are areas that need improvement? What evidence indicates this need for improvement? Write a reflective paper that summarizes your findings. Discuss the needs of your school or district and provide evidence that supports your response. Include recommendations and action steps for improvement in the area of need you identified.

Project: Professional Development Plan for STEM 25% of grade
Outline a STEM professional development plan (year-long) for a specific audience. Then design a professional development experience (1 or 2 days) that aligns with the professional development plan. Include how you will evaluate the professional development experience to determine outcomes of the experience.

Reflections over reading 25% of grade
A variety of reading assignments will be given throughout the course. Questions for reflection will be posted for Discussion. Students will post a response for each question and reply to 2 posts from other students for each question.

VIII. Grading Scale
90% - 100% = A
80% - 89% = B
70% - 79% = C
0% - 69% = F
The weight of the evaluation criteria may vary according to each instructor and will be communicated at the beginning of the course.

UNIVERSITY POLICIES

Academic Honesty

- The Undergraduate Bulletin defines academic dishonesty as “...those acts which would deceive, cheat, or defraud so as to promote one’s scholastic record...”, and states that “[v]iolations of academic honesty represent a serious breach of discipline and may be considered grounds for disciplinary action, including dismissal from the university”. Students are expected to understand and abide by the rules governing academic honesty.
- The official statement about academic honesty, including plagiarism, may be accessed at: http://www.semo.edu/bulletin/.
- Additional information may be accessed at: http://www6.semo.edu/judaffairs/.
- Penalties for academic dishonesty range from failing the assignment and/or failing the course to expulsion from the University.

Civility and Harassment In this class, there will be discussion of topics that may be sensitive to some, and a diversity of viewpoints may be expressed. It is important to understand many points of view when learning and developing an opinion about a topic. You are expected to help maintain a civil and mutually respectful environment for everyone involved in the course. You are expected to be familiar and abide by the Code of Student Conduct
A major determinant of a successful educational experience is a shared sense of respect among and between the students and their instructor. We all share responsibility for creating and maintaining a climate of mutual respect and an environment free from harassment.

Adhering to generally accepted standards of behavior will help facilitate a positive experience for all.

Please turn off all electronic devices during class. When your cell phone rings, for example, it distracts others and may throw a great discussion off course.

If you need to leave the room, try to wait for a moment that is least distracting.

When we have class discussions, don’t attack people but, instead, constructively and reflectively respond to the ideas being expressed. One of the important reasons for engaging in discussion is that by advancing our ideas in a public forum, our ideas get better. Through dialogue we have the opportunity to learn new things and, potentially, change old beliefs. In order to accomplish this, we need to work together to maintain a climate of mutual respect.

More specific information about the Student Code of Conduct which governs student behavior can be found by clicking on the “Statement of Student Rights and Code of Student Conduct” link found at http://www.semo.edu/pdf/stuconduct-code-conduct.pdf

ACCESSIBILITY STATEMENT

Southeast Missouri State University will take such means as are necessary to insure that no qualified disabled person is denied the benefits of, excluded from participation in, or otherwise subject to discrimination because Southeast Missouri State University’s facilities are physically inaccessible to, or unusable by disabled persons. The accessibility standard required by Federal law for ‘existing facilities’ is that the recipient’s program or activities when viewed in its entirety, must be readily accessible to disabled persons. For more information, see the Disability Support Services page or contact Disability Support Services, room 302, University Center, (573)651-2273.

Questions, comments or requests regarding this course should be taken to your instructor. Unanswered questions or unresolved issues involving this class may be taken to Dr. Rachel Morgan Theall, the director of the STEM MNS program.