Education (EDUC)

Courses

EDUC 1001. FYE: Education. 1 Hour.
First Year Experience course recommended for entering freshmen and transfer students with 0-24 credits. Designed to help students adapt to university life and become integrated into Dixie State University. Students will refine academic skills, create and foster social networks, learn about university resources, and explore different fields of study, degree options, and career opportunities in Education. Multiple listed with all other sections of First Year Experience (all 1001 courses, ENGR 1000). Students may only take one FYE course for credit. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Know how to succeed academically by using a course syllabus, taking good notes, studying effectively, reading a college textbook, talking to your professors, recognizing and dealing with test anxiety, taking tests effectively, staying motivated, and avoiding academic dishonesty. 2. Know some strategies for dealing with the challenges of college life for managing your time, staying safe on campus, recognizing and dealing with stress, staying healthy, and managing money. 3. Know your way around Dixie State University including where to find buildings and services that you may need on campus, what campus services are available to you, how to do things like add classes, drop classes, change your major, check your account balance, and use your D-mail, what academic policies are found in the University Catalog, how to get involved in college life, what your rights and responsibilities are as a student. 4. Understand your major or area of study including why education is important for you, what General Education is and how to fulfill the GE requirements, how to form a college network, how to choose a major that is right for you, what the course requirements are in your major, how to construct a graduation plan, and what kinds of careers your major offers. FA, SP.

EDUC 1010. Foundations/Intro to Education. 3 Hours.
Required prerequisite course for both the Elementary Education degree and the Secondary Education Program. Provides an overview of vocational aspects of a teaching career including: certification requirements, foundations of education, current and historical issues in education, an overview of current trends in methodology, and classroom management. This class provides students with an opportunity to assess oneself as a prospective teacher. Various teaching methods are used including lecture, cooperative learning, inquiry methods, direct instruction and mastery learning. Students are required to do two full observation days in local K-12 school settings. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Review the professional aspects of teaching as a career; express personal philosophy of education; examine educational views, teaching styles, and school programs and practices; and assess information and experiences to decide on a career in teaching. 2. Identify social issues affecting the schools; and explain the historical, philosophical and other related issues influencing education. 3. Recognize the cultural diversity in our society; understand individual learner differences and cultural linguistic diversity; and be a reflective practitioner who uses evidence to continually evaluate and adapt practice to meet the needs of each learner. 4. Describe public schooling in the United States and current aspects of our educational system and understand the central concepts, tools of inquiry and structures of the discipline. 5. Identify effective ways to engage collaboratively with learners, families, colleagues, and community members to build a shared vision and supportive professional culture focused on student growth and success. 6. Understand that teachers demonstrate the highest standard of legal, moral, and ethical conduct as specified in Utah State Board Rule R277-515; and understand the multiple methods of assessment to engage learners in their own growth, monitor learner progress, guide planning and instruction and determine whether the outcomes described in content standards have been met. 7. Understand that teachers plan instruction to support students in meeting rigorous learning goals by drawing upon knowledge of content areas, Utah Core Standards, instructional best practices, and the community context; and understand how to use various instructional strategies to ensure that all learners develop a deep understanding of content areas and their connections and build skills to apply and extend knowledge in meaningful ways. 8. Understand how to create environments that support individual and collaborative learning, positive social interactions, active engagement in learning, and self-motivation. FA, SP, SU.

EDUC 2010. Intro to Exceptional Learners. 3 Hours.
Required pre-requisite course for both the Elementary Education degree and the Secondary Education Program. Provides an overview of exceptional students and examines the teacher's role in integrating these students into the K-12 classroom. Identifies characteristics and special needs of students who have physical, emotional, social, mental, or health exceptionalities. In addition, students will learn the basic laws and policies of Special Education and the key characteristics of inclusion and co-teaching. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Understand and identify the IDEA definition of and the learning and behavioral characteristics of students with different exceptionalities. 2. Identify appropriate instructional accommodations and modifications to meet the individual learning needs of exceptional learners. 3. Identify issues and challenges faced by individuals and families of individuals with disabilities. 4. Explain the philosophical and historical perspectives that have formed the basis for public policy regarding exceptionality as well as current legislation that shape service delivery. 5. Identify effective practices for inclusive and collaborative teaching situations that best contribute to a positive learning environment. FA, SP, SU.
EDUC 2400. Foundations Multicultural/ESL (SS, GC, ALCI). 3 Hours.
Fulfills General Education requirement for social science and global and cultural perspectives. Required prerequisite course for both the Elementary Education degree and the Secondary Education Program. Teacher candidates will examine a variety of theoretical frameworks associated with multicultural education and current issues affecting diverse students in the educational setting. The course content and assessments will provide teacher candidates with opportunities to discuss and reflect on issues of race, gender, individual differences, and ethnic as well as cultural perspectives. Additionally, a foundation of language acquisition theory and sheltered English techniques will also be introduced to address the needs of English Language Learners. This course also partially fulfills the requirement for ESL Endorsement. This course is designated as an Active Learning Cultural Immersion (ALCI) course. Students have a unique opportunity to learn another culture as part of the learning objectives of this course. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Examine multicultural education and demonstrate foundational knowledge and applications of multicultural education in the United States. 2. Analyze how race, religion, gender, language, age, and socioeconomic status affect teaching and learning. 3. Explore how to develop and design a democratic, inclusive, and inviting classroom. 4. Investigate how to reduce sources of biases, stereotypes, and prejudices in the curriculum and classrooms. 5. Evaluate how globalization and transnationalism affect English language learners. 6. Identify and interpret the contextual factors of a classroom, school, district, and state. FA, SP, SU.

EDUC 2500. Instructional Technology in K-12 Classrooms. 3 Hours.
Required pre-requisite for both the Elementary and Secondary Education Programs. Candidates will research and evaluate technology resources for quality, accuracy, and effectiveness. Candidates will apply state and national technology standards as they design, implement, and assess digital learning experiences to engage students and improve learning in K-12 classrooms to enrich professional practice. Course must be taken within 5 years of application to the Education Programs. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Gain awareness of national, program, and State standards for student learning (e.g., ISTE/NETS, National Educational Technology Standards for Teachers; INTASC/TEAC; Utah State Office Curriculum Standards; Utah Effective Teaching Standards (UETS) - Standard 7: Instructional Strategies etc.). 2. Use various instructional strategies to ensure that all learners develop a deep understanding of content areas and their connections, and build skills to apply and extend knowledge in meaningful ways. 3. Support content and skill development by using multiple media and technology resources efficiently, and be able to evaluate these resources for quality, accuracy, and effectiveness. 4. Research the county, state, and national education standards. 5. Review & explore UEN.org. 6. Use multiple media and technology resources to enhance instructional strategies by creating and designing the following multimedia projects: digital images, audio sound clips, videos, posters, slideshow presentations, coding, webquests, websites/eportfolios, quizzes, and assessments. 7. Use technology proficiently by using online programs, resources, and within different computer devices, and iPad applications to use as a teachers and with students. 8. Use multiple technology tools to assess student learning and give my students the opportunity to be creative in their own learning by using a variety of technology tools and programs online to create multimedia projects as listed previously. 9. Research technology resources for quality, accuracy, and effectiveness. 10. Learn & explore teacher and student technology resources to use in the classroom, such as, applications, online multimedia programs and websites. FA, SP, SU.

EDUC 2899. Travel Study Japan: Culture, Education, and People. 3 Hours.
Introductory course for students interested in culture and the public educational system of Japan. This course is a three (3) week classroom course followed by a ten (10) day travel study trip to Japan. The purpose of the course will be to learn about the culture of Japan through history, education and its people. In the three week intensive course module that occurs prior to the trip to Japan, students will participate in lecture/discussions that will build knowledge about different regions of Japan we will visit, as well as the entire country and the culture. After the introduction, the lecture/discussions will focus on the educational system of Japan to explore the differences and similarities between the US and Japanese educational system. In addition to visits to historical landmarks, excursions to public schools are included to experience the Japanese educational system. Home stay is also included at one of the regions visited. Additional travel fee required. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Demonstrates understanding of globalization and transnationalism to identify the relationship with the world we live in. 2. Develop a culturally responsive lesson plan. 3. Demonstrate knowledge of education through comparing the US and Japanese educational system. Prerequisite: Instructor permission. SU (odd).

EDUC 2990. Seminar in Education. 0.5-3 Hours.
For students wishing instruction that is not available through other regularly scheduled courses in this discipline. Occasionally, either students request some type of non-traditional instruction, or an unanticipated opportunity for instruction presents itself. This seminar course provides a variable credit context for these purposes. As requirements, this seminar course must first be pre-approved by the department chair; second, it must provide at least nine contact hours of lab or lecture for each credit offered; and third, it must include some academic project or paper (i.e., credit is not given for attendance alone). This course may include standard lectures, travel and field trips, guest speakers, laboratory exercises, or other nontraditional instruction methods. Note that this course in an elective and does not fulfill general education or program requirements. Fees may be required for some seminar courses and instructor permission will be optional at the request of the instructor. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Demonstrate learning through original and creative ideas. 2. Collaborate with others to accomplish a shared purpose or goal. 3. Use appropriate strategies and tools to represent, analyze, and integrate seminar-specific knowledge. 4. Develop the ability to think critically about course content. 5. Apply knowledge from seminar to a range of contexts, problems, and solutions.
EDUC 3110. Educational Psychology. 3 Hours.
Required prerequisite course for both the Elementary Education degree and the Secondary Education program. Provides teacher candidates with an overview of the relationship of psychology to teaching and learning. Students will learn about the nature of learning, human brain growth, the impact of brain research, child and adolescent development and how the brain processes information. An emphasis is placed on how teacher candidates can apply the theories and practices of educational psychology into day-to-day teaching practices. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Identify key researchers and their contributions to education and/or educational psychology. 2. Understand the importance of educational research; use the APA format to describe and analyze findings of research studies. 3. Describe characteristics and stages of cognitive, physical, and emotional development. 4. Understand how to design instruction and assessments that are appropriate for social, cognitive, and emotional development. 5. Reflect upon course content and its applications to future professional learning, classroom practice, and career goals. 6. Recognize signs of learner distress and how to respond with appropriate interventions including referral to counselors, social workers, and other support personnel. Prerequisite: FSHD 1500, or PSY 1010, or PSY 1100. FA, SP, SU.

EDUC 3990. Seminar in Education. 0.5-3 Hours.
For students wishing instruction that is not available through other regularly scheduled courses in this discipline. Occasionally, either students request some type of non-traditional instruction, or an unanticipated opportunity for instruction presents itself. This seminar course provides a variable credit context for these purposes. As requirements, this seminar course must first be pre-approved by the department chair; second, it must provide at least nine contact hours of lab or lecture for each credit offered; and third, it must include some academic project or paper (i.e., credit is not given for attendance alone). This course may include standard lectures, travel and field trips, guest speakers, laboratory exercises, or other nontraditional instruction methods. Note that this course in an elective and does not fulfill general education or program requirements. Fees may be required for some seminar courses and instructor permission will be optional at the request of the instructor. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Demonstrate learning through original and creative ideas. 2. Collaborate with others to accomplish a shared purpose or goal. 3. Use appropriate strategies and tools to represent, analyze, and integrate seminar-specific knowledge. 4. Develop the ability to think critically about course content. 5. Apply knowledge from seminar to a range of contexts, problems, and solutions.

EDUC 4700. Foundations of Dual Language Immersion Education. 3 Hours.
For those seeking Dual Immersion Education endorsement. Emphasizes the theoretical and practical background about Dual Immersion Education. Overview of Dual Language Immersion Education, program models, teaching and learning issues in Dual Language Immersion Programs, and challenges of Dual Language Immersion Programs will be addressed to assist the success of prospective immersion teachers in the classroom. Eligible languages include Spanish, French, Mandarin Chinese, German, and Portuguese. This course meets partial requirements for the Dual Language Immersion Endorsement for the state of Utah. Dual listed with HUM 4000 and SPAN 4000 (students may only take one course for credit). **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Discuss theoretical principles and research findings that underlie dual language and immersion education. 2. Explain differences and similarities between one-way, two-way, developmental bilingual, and indigenous language immersion programs. 3. Summarize key principles of first and second language in dual language and immersion classrooms. 4. Discuss the social and political contexts for dual language education and their implications for classrooms and programs. 5. Synthesize lessons that can be learned from dual language and immersion programs around the world and based on class observations in the DLI schools in the local school district. FA.

EDUC 4990. Seminar in Education. 0.5-3 Hours.
For students wishing instruction that is not available through other regularly scheduled courses in this discipline. Occasionally, either students request some type of non-traditional instruction, or an unanticipated opportunity for instruction presents itself. This seminar course provides a variable credit context for these purposes. As requirements, this seminar course must first be pre-approved by the department chair; second, it must provide at least nine contact hours of lab or lecture for each credit offered; and third, it must include some academic project or paper (i.e., credit is not given for attendance alone). This course may include standard lectures, travel and field trips, guest speakers, laboratory exercises, or other nontraditional instruction methods. Note that this course in an elective and does not fulfill general education or program requirements. Fees may be required for some seminar courses and instructor permission will be optional at the request of the instructor. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Demonstrate learning through original and creative ideas. 2. Collaborate with others to accomplish a shared purpose or goals. 3. Use appropriate strategies and tools to represent, analyze, and integrate seminar-specific knowledge. 4. Develop the ability to think critically about course content. 5. Apply knowledge from seminar to a range of contexts, problems, and solutions.
EDUC 5010. Data Analysis and Problem Solving in STEM. 3 Hours.
This course will develop a firm problem-solving foundation. Using skills and strategies applied in mathematical contexts practicing teachers will learn to gather data, work with others, present solutions orally to the whole class, and write up detailed solutions. This course will also provide practicing teachers a deeper understanding of probability and data representation and analysis. Special attention in this course will be given to children's typical error patterns, problem solving strategies, interpreting and assessing students' work and learning, and integration of the National Council of Teachers of Mathematics Process Standards and the Standards for Mathematical Practice. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Select appropriate strategies to solve a problem. 2. Solve challenging mathematical problems in groups and individually. 3. Write problem-solving summaries, communicate orally solution processes and conclusions, and improve collaboration skills. 4. Communicate data analysis and problem-solving strategies orally, visually, and in writing, as well as facilitate effective discourse in a positive mathematics learning environment. 5. Collect and organize data using tally marks, tables, pictographs, bar graphs, line graphs, frequency tables, line plots, stem-and-leaf plots, circle graphs, scatter plots, histograms, and box-and-whisker plots. 6. Select and interpret measures of central tendency (e.g. mean, median, and mode, including the impact of outliers). 7. Select and interpret measures of dispersion (e.g. range, variance, standard deviation, percentiles). 8. Identify and apply concepts of probability including: likely, unlikely, certain, impossible, sample space, experimental and theoretical, and recognition of probability as a value between 0 and 1. 9. Conduct experiments with and without replacement and compare theoretical and experimental probabilities. 10. Analyze misrepresentation and misleading data that exists in the real world, in order to become informed "consumers" of data. 11. Develop lesson plans including assessments to teach to your own students that incorporate the above outcomes as appropriate to your grade level. 12. Develop a unit test using a test blueprint. 13. Record reflections on how your mathematical and pedagogical thinking changes over the course of the semester. Prerequisite: Instructor permission.

EDUC 5020. Nature of Science and Engineering. 3 Hours.
In this course participants will experience introductory explorations of the nature of science using science and engineering principles, practices, and processes. Applications to Science, Technology, Engineering and Mathematics will be explored using learner-based pedagogy. Participants will develop teaching practices to assist them in educating K-6 students in selected Earth and Life Science Standards. As appropriate and available, STEM content professors will be involved in the instruction of this course. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Develop a deeper understanding of the nature of science and engineering through using scientific understanding and engineering solutions for topics relative to climate change and natural selection, demonstrating that science is a way of knowing and assumes an order and consistency in natural systems, comparing and contrasting the process of scientific inquiry with the engineering design cycle, and using empirical evidence to develop scientific knowledge and engineering solutions. 2. Explain that stability and change are present in all natural and built systems and conditions of stability, and rates of change or evolution of a system are critical elements of study by providing evidence to support natural climate cycles and natural selection, demonstrating how rate of change of any natural system impacts evolutionary change, and providing evidence to support scientific claims using effective argumentation. 3. Connect theory and practice through reflection, teaching, scholarship, collaboration, and STEM educational action research which include traditionally under-represented groups that consider students of diverse backgrounds and perspectives through collaborating with colleagues in lesson development, conducting an effective student inquiry-based classroom, integrating cross-curricular learning, and recording reflections on how your STEM content and pedagogical thinking changes over the course of the semester. 4. Demonstrate proficiency with STEM content, skills, and practices and teach those to students by communicating using multiple forms of discourse, developing reasoning and problem solving practices, facilitating effective collaboration and communication among the students, demonstrating proficiency in STEM content. 5. Explore and implement innovative, research-based, engaging curriculum and assessment, especially around the Utah Core academic standards and college and career readiness, geared towards increasing student achievement by applying the disciplinary core ideas when planning lessons and teaching, using cross-cutting concepts when planning lessons and teaching, implementing scientific practices into lesson planning and teaching, implementing a variety of assessments into lesson planning and teaching. Prerequisite: Instructor permission.

EDUC 5030. Energy in STEM Education. 3 Hours.
This course provides teachers with a deep and useful understanding of energy and the nature of how students use concepts of energy to make sense of phenomena across life, earth, and physical science. This understanding enhances teacher insights into: 1) how matter and energy interact, 2) the relationships of energy to forces and interactions within fields, and 3) pedagogical content knowledge around teaching and learning about energy. The course provides teachers with knowledge of how energy concepts may be used by students with the Crosscutting Concepts, and Engineering and Science practices found in the Next Generation Science Standards. STEM content professors will be involved in the instruction of this course. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Understand the role of energy in systems in the natural and material world and relate it to STEM instruction in elementary classrooms including: the water cycle requires energy, relationships in ecosystems are dependent on energy, energy is used in everyday life, and moving objects contain energy, waves can transmit energy. 2. Understand and apply the cross-cutting concept of Energy and Matter in the classroom including: the transfer of energy drives the flows and cycles of matter, matter is conserved as it flows and cycles, and tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems' possibilities and limitations. 3. Explore and implement innovative, research-based, engaging curriculum, especially around the Utah Core academic standards and college and career readiness, geared towards increasing student achievement for ALL students by applying the disciplinary core ideas when planning lessons and teaching, using crosscutting concepts when planning lessons and teaching, implementing scientific and engineering practices into lesson planning and teaching, using lesson plan formats that integrate all four STEM disciplines into lesson planning and teaching, and applying a variety of effective assessment strategies into lesson planning and teaching. 4. Develop the confidence, skills and dispositions to be a teacher leader in STEM Education by preparing and teaching model lessons, planning with colleagues, completing presentations for local and statewide efforts, etc, practicing continuous written reflection for the purpose of improving your practice. 5. Demonstrate proficiency with STEM content, skills, and practices and teach those to students by communicating using multiple forms of discourse, developing reasoning and problem solving practices, and facilitating effective collaboration and communication among the students. Prerequisite: Instructor permission.
EDUC 5040. Matter in STEM Education. 3 Hours.
This course provides teachers with a deep and useful understanding of matter and the nature of how students use concepts of matter to make sense of phenomena across life, earth, and physical science. This understanding enhances teacher insights into: 1) how force, matter and energy interact, 2) the relationship of force to energy and interactions within fields, and 3) pedagogical content knowledge around teaching and learning about force. The course provides teachers with knowledge of how concepts of force may be used by students with the Crosscutting Concepts, and Engineering and Science practices as outlined in the Next Generation Science Standards. STEM content professors will be involved in the instruction of this course. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Understand that the types of atoms present and the interactions both between and within them differentiate matter; the states (i.e., solid, liquid, gas, or plasma), properties (e.g., hardness, conductivity), and reactions (both physical and chemical) of matter can be described and predicted based on the types, interactions, and motions of the atoms within it; and chemical reactions, which underlie so many observed phenomena in living and nonliving systems alike, conserve the number of atoms of each type but change their arrangement into molecules. 2. Investigate STEM content and pedagogy related to matter through four of the seven crosscutting concepts found in the Next Generation Science Standards: cause and effect, systems and system models, energy and matter, and stability and change. 3. Improve their teaching skill practice by performing the following: connect theory and practice through effective teaching, scholarship, and STEM educational action research; develop the capacity and confidence to run a student inquiry-based classroom using the crosscutting concepts and core ideas as presented in the Next Generation Science Standards; improve ability to design a variety of effective assessment strategies including using formative assessment to design authentic, innovative, problem-based learning experiences; explore uses of technological tools to enhance STEM teaching, learning, student achievement, and college and career readiness; become a reflective teacher by recording your learning and teaching experiences in a journal and reflecting on your success and need for improvement; and work with colleagues to develop lesson and assessment plans differentiated according to student needs for STEM integration for ALL students in your classroom.

EDUC 5050. Force in STEM Education. 3 Hours.
This course provides teachers with a deep and useful understanding of force and the nature of how students use concepts of force to make sense of phenomena across life, earth, and physical science. This understanding enhances teacher insights into: 1) how force, matter and energy interact, 2) the relationship of force to energy and interactions within fields, and 3) pedagogical content knowledge around teaching and learning about force. The course provides teachers with knowledge of how concepts of force may be used by students with the Crosscutting Concepts, and Engineering and Science practices as outlined in the Next Generation Science Standards. STEM content professors will be involved in the instruction of this course. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Understand the role of force in systems in the natural and material world and relate it to STEM instruction in elementary classrooms including: gravity and its role in the solar system; and forces that impact Earth’s materials and systems; the relationship between force, mass, acceleration, inertia, and energy transfer. 2. Understand and apply the crosscutting concept of cause and effect to learn about and teach disciplinary core ideas related to force. 3. Improve the skills and dispositions to be a teacher leader in STEM including using model instruction, reflection, planning with colleagues, completing presentations for local and statewide efforts, etc. 4. Improve assessment skills by using student achievement data to design authentic, innovative, problem-based learning experiences, using formative assessment to inform instruction, using a variety of assessment strategies to collect student achievement data. 5. Engage students in integrated technology to enhance their learning, achievement, and college career readiness. 6. Explore and implement innovative, research-based, engaging curriculum, especially around the Utah Core academic standards and college and career readiness, geared towards increasing student achievement for ALL students. 7. Apply the disciplinary core ideas when planning lessons and teaching using crosscutting concepts when planning lessons and teaching as well as implementing scientific and engineering practices into lesson planning and teaching. Prerequisite: Instructor permission.

EDUC 5060. STEM Practices in Technology and Problem-Based Learning. 3 Hours.
The STEM Practices course will engage participants in developing meaningful understandings of problem-based approaches to teaching, learning, and the integration of STEM practices across the curriculum using appropriate technology. Participants will demonstrate their skills through the development and creation of a problem-based, hands-on experience. **COURSE LEARNING OUTCOMES (CLOs) At the successful conclusion of this course, students will be able to: 1. Demonstrate the ability to provide access for all students to STEM education, including traditionally underrepresented groups that consider students of diverse backgrounds and perspectives. 2. Create a safe and supportive learning environment for all students to engage and learn integrated STEM concepts and practices. 3. Use student achievement data and formative assessment to design authentic, innovative, problem-based learning experiences. 4. Incorporate the nature of science and the engineering design cycle in lesson planning as outlined in the eight Scientific and Engineering Practices of the Next General Science Standards. 5. Implement appropriate assessment and technological tools to enhance STEM teaching, learning, student achievement, and college career readiness. 6. Work with colleagues to develop and use effective methods for organization and management of a problem-based learning environment to engage students in STEM learning. 7. Improve teaching and learning through reflective practice. Prerequisite: Instructor permission.