Graduate School of Education

Elective Course Options: Educational Technology

Students enrolled in the M.Ed. in Educational Technology or M.Ed. in Educational Technology Leading to Initial Teacher License in Instructional Technology (All Levels) can choose electives from the courses listed below. Please note that some courses have prerequisites for registration, which are listed at the end of the course description.

Technology Courses

ECOMP 6003 Using Technology to Integrate Mathematics Across the Curriculum
3 credits
This course focuses on using technology to integrate mathematics with other subjects. Students will explore interdisciplinary activities, focusing on using data and a visual database as tools to engage students and enhance their understanding in math and other disciplines. In addition, we will look at collaborative web tools and video to support learning and productive collaboration. Free web resources, from high-stakes testing support to education-focused virtual reality games, will also be featured.

ECOMP 6012 Cyberbullying in Schools: Awareness, Prevention & Intervention
3 credits
This course will introduce educators to the world of cyberbullying. Through readings, discussions, group work, and simulations, the course will focus on how cyberbullying happens and the manifestation of it in the classroom and beyond. The legal implications for students, teachers, schools, and districts will also be explored. The course will conclude with class-created recommendations on actions that educators can take today to create a classroom/school culture that rejects cyberbullying.

ECOMP 6013 iPads: Innovation and Inquiry
3 credits
iPads are transforming learning environments by redefining the way the students can create content and interact with the curriculum. Take a close look at the different ways that iPads can be used to encourage critical thinking and creativity, and foster student control over their own learning. With your colleagues, tease out strategies for shared use of the iPad and explore one-to-one deployment issues in the classroom.

ECOMP 6014 Apps in Your Classroom: The Mobile Technology Revolution
3 credits
Explore the powerful potential of using mobile technologies in your classroom. Bring your own mobile device and use it to explore classroom-based projects that empower student learning. Then create your own project. Explore a world of educational apps and join your colleagues in learning how even free apps can support your students. Learn how apps are constructed, and create your own apps. Unlock the amazing emerging potential of mobile technologies for your classroom.

ECOMP 6016 Teaching and Learning with Digital Media
3 credits
This course will help educators to harness the power of digital media for teaching and learning. They will learn to use that power to transform traditional teacher-centered classrooms into student-focused learning environments where students use digital media for the acquisition, analysis, construction, and presentation of knowledge. Hands-on experiences will also help them develop proficiency with the tools and skills needed for authoring and publishing digital media in a variety of formats for student learning.

ECOMP 6018 Learning, Design, and Robotics: Gateway to Critical Thinking
3 credits
Our robotics laboratory is a fun, engaging course that infuses engineering-based projects into K-12 instruction. We build robots from scratch; learn programming with and without electronics; experiment with simulations; develop media-rich curricula while integrating common core and STEM standards; examine trending issues in Science, Technology, Engineering, Arts and Mathematics (STEAM) education; and discuss the pedagogies that support these approaches. Encouragement of pupils under-represented in STEM K-12 classes is examined. Participants purchase robotic kits in lieu of textbooks. All levels welcome.

ECOMP 6019 Social Media and Education
3 credits
This project-based course introduces educators to social media for their teaching practice. We identify, experience, and evaluate selected social media applications and critically consider the implications for learning in and out of the classroom. Students are encouraged to apply social media features, such as authentic communication, to address ELL and accessibility. Social media is integrated into our class assignments, so rather than learn tools, we "work the web."

ECOMP 6020 Digital Technology: How It Works
3 credits
This course focuses on conceptual understanding of how digital technologies work, both technically (internally) and practically (with humans). The course demystifies digital technology and expands students' knowledge of the deep commonalities as well as the differences between its different forms. Digital technology is studied in its social and historical contexts, revealing the relations between people and the technology they use, in and outside classrooms, and how both technology and those relations change symbiotically over time.

ECOMP 6022 Teach the World in Your Classroom
3 credits
This course will help educators harness the power of global connections for teaching and learning. Teachers will learn to integrate readily available digitized resources to transform traditional classroom learning materials by making use of a vastly expanded horizon for the acquisition, analysis, construction, and presentation of knowledge. Hands-on experiences will help teachers use streaming media resources, primary source artifacts, webcams, and field trips. They will create new materials for shaping twenty-first century global citizenship.

ECOMP 6101 Technology: Facilitating Change for Education
3 credits
Social networking, global learning, cyberbullying, online predators, and individual privacy – empower your students to stay safe and thrive in our digital world. Being an excellent teacher, parent, and citizen means understanding how our lives and our practices are changed by technology. You will learn strategies to manage technology for the benefit of your students. Examine how technology is changing every aspect of our lives and the ways we interact with one another: how we learn, create, work, study, and play.

ECOMP 6201 Online Teaching: Introduction to Design and Practice
3 credits
This course is designed to introduce teaching online to K-12 educators. Utilizing a constructivist learning approach, we will explore the advantages of online learning and features of online environments and online collaborative tools, and examine the best pedagogical practices for teaching and learning online. Expectations, characteristics, and needs of online learners will be examined and specific strategies to help students assess their readiness to learn online will be developed. Solutions for involving all of the K-12 stakeholders and the challenge of keeping students motivated to produce quality work through online learning will be explored.

ECOMP 6202 Online Teaching: Assessment and Evaluation
3 credits
This course examines assessment and evaluation in an online learning environment from the perspective of teachers and students in K-12 environments. A wide variety of effective assessment strategies are presented, including self-evaluation, authentic assessment, triangulation, continuous evaluation, pre- and post-testing, use of observational data, and others. Particular attention is paid to selecting the most appropriate and engaging assessment strategies for students and content that addresses the needs of students, keeping in mind the need to apply Universal Design for Learning (UDL) principles when selecting assessment methods.

ECOMP 6203 Online Teaching: Building Communities and Facilitating Student Discussions
3 credits
This course focuses on building the expertise needed to create a supportive and constructive online learning environment through appropriate facilitation techniques and strategies. Participants investigate various aspects of facilitating online discussions, including teacher and peer moderated communication, developing guidelines and modeling substantive discussions, and the use of multiple technologies to enhance contact with and among students.

ECOMP 6204 Online Teaching: Course Design, Development, and Strategies
3 credits
This course provides the opportunity to synthesize components of online teaching by involving participants in the development of an online course. Content and age appropriate online activities and strategies that will engage students are studied and developed. Educational theory, best practices in online learning, principles of Universal Design for Learning (UDL) and use of emerging technologies are researched, analyzed and used to produce online lessons that are viable and engage students in authentic learning. *Prerequisites: ECOMP 6201, ECOMP 6202, and ECOMP 6203*

ECOMP 6210 Art Techne
3 credits
In this multimedia project-based course, educators teach interdisciplinary topics by applying artistic concepts. Digital art techniques will support innovative teaching and creative learning in their discipline. Students will be empowered to not only use electronic media in new and creative ways, but also be able to formulate their own interdisciplinary ideas that they can use in the classroom. The course core concepts cover: a) education related issues for today's participatory media producers, and b) game creation as a means of teaching and learning.

ECOMP 7010 Emerging Tech: Bringing the Future to Your Classroom
3 credits
Learn about promising technologies including eye tracking, 3D printers, and wearable computers. Explore the possibilities for trends such as the Maker Movement and the Flipped Classroom. Discover the latest web-based resources and collaboration tools for every grade level and subject area. Learn to integrate emerging technologies into existing curricula while promoting transformative thinking and creativity. Build your expertise and gain experience in identifying the efficacy of future technologies for enhancing student learning.

ECOMP 7017 Online Teaching: Issues and Implementation
3 credits
This course focuses on concepts and issues related to online education. Students will advance their knowledge of teaching and learning online including development and implementation of online courses. Issues of pedagogy, methodology, challenges and current state of the field will be examined. With guided practice, students will engage in developing and leading online seminars.

ECOMP 7200 Designing and Implementing Educational Websites
3 credits
Equip yourself to build an Internet presence for your educational organization that supports teaching and learning as well as other important organizational functions. Participants utilize either their own web resources or free (easy to use) educational web design tools to create an online presence. The course also explores secure website hosting and cloud computing; using Google (for example) as your "invisible" secure IT service; online communication and collaboration tools; and a range of website design tools.

Math Courses

CMATH 6107 Constructing Mathematical Understanding: Number and Operations
3 credits
Participants will develop a solid conceptual understanding of the language and operations of arithmetic, as well as the interrelationships among arithmetic, algebra, and geometry. Topics include place value and the history of counting, inverse processes, the geometry of multiplication, the many faces of division, and conceptual models of integers and rational numbers.

CMATH 6108 Constructing Mathematical Understanding for Number Theory
3 credits
Participants develop a solid conceptual understanding of the branch of mathematics known as number theory. Topics include properties of prime, composite, abundant, deficient, and perfect numbers; divisibility rules; and the use of geometric and other representations for finding prime factorizations and greatest common factors. Participants will also investigate the fundamental theorem of arithmetic, computing in different bases, and arithmetic progressions.

CMATH 6109 Functions and Algebra I: Building Mathematical Understanding
3 credits
Participants develop a solid conceptual understanding of the branch of mathematics known as algebra. Topics will include ratio and proportion, slope, operations with integers, the notion of function, absolute value, linear versus non-linear functions, sets, equations, inequalities, simultaneous equations and demand functions.

CMATH 6110 Functions and Algebra II: Broadening the Base
3 credits
This course builds on its prerequisite, Functions and Algebra I, studying wider classes of functions, their graphs, and applications; detailed study of quadratic functions; solutions of quadratic equations; applications in physics and optimization; introduction to general polynomials and rational functions, with applications to physics and optimization; exponential functions, with applications to growth and decay; and Newton's law of cooling. *Prerequisite: CMATH 6109*

CMATH 6111 Geometry and Measurement I: From Polygons to Pythagoras
3 credits
This first course integrates the study of geometry and measurement and includes lines, angles, investigations of triangles including sorting, similarity, trigonometry, and Pythagoras' Theorem. We will also investigate quadrilaterals, polygons, area, and perimeter. Participants will examine the nature of geometric definitions and follow a path that explores mathematical explanation, argument, and justification and how these processes connect to geometric proof.

CMATH 6112 Geometry and Measurement II: Circles, Symmetry, and Solids
3 credits
The second geometry and measurement course starts with a focus on measurement and picks up where course one leaves off. Topics include finding the area of irregular shapes, investigating circles, exploring symmetry, and looking at both the geometry and measurement of 3 dimensional solids. Participants will continue to explore how processes of mathematical explanation and justification connect to geometric proof. *Prerequisite: CMATH 6111*

CMATH 6113 Probability: The Mathematics of Uncertainty
3 credits
Participants will develop a solid conceptual understanding of the language and operations of arithmetic, as well as the interrelationships among arithmetic, algebra and geometry. Topics include place value and the history of counting, inverse processes, the geometry of multiplication, the many faces of division, and conceptual models of integers and rational numbers. *Prerequisite: CMATH 6109*

CMATH 6114 Statistics and Data Analysis
3 credits
This course on descriptive and inferential statistics uses a collaborative inquiry approach that will develop the participant's ability to critically collect, analyze, and describe qualitative and quantitative data and a variety of verbal, visual and numerical ways. The course will lead participants to becoming both better producers of statistical information and more critical consumers of data based claims and arguments. *Prerequisite: CMATH 6113*

CMATH 6115 Concepts of Calculus: Change and Infinity
Building on prior number, functions, and geometry courses, calculus extends ideas developed there to the concepts of limit and change. Participants are introduced to an important branch of modern mathematics and are shown how calculus relates to other more elementary areas of mathematics. Topics include ideas of a limit, the concept of instantaneous change, and the fundamental theorem of calculus. *Prerequisites: CMATH 6110 and CMATH 6112*

EEDUC 6154 Meeting Diverse Needs in the Mathematics Classroom
3 credits
This course considers the theory, research, and practical applications of ensuring that all children succeed mathematically. Gender, socioeconomics, culture, language, learning differences, assessment, and differentiated instruction are considered.

EEDUC 7121 Assessment Issues in Mathematics: Summative and Formative
3 credits
This course is designed to engage participants in the examination of both summative and formative assessments and their implications for teaching and learning. Various types of classroom assessments and how they can be used to make instructional decisions based upon student responses will be developed. Participants will also examine how to make sense of the scores reported via standardized tests, what they mean, and what the implications are at the district, school, classroom, and individual student levels.

Science Courses

CNSCI 5100 Introduction to Physical Science
3 credits
In this introductory course on science inquiry participants investigate common everyday phenomena. This course invites participants to “uncover” the complexity of a simple glass of water. They observe physical processes at play in this familiar system and develop scientific "habits of mind." Participants see how scientific principles can be applied to understanding the world around us. The following key physical science concepts are explored: density, displacement, buoyancy, melting, freezing, equilibrium, phase changes and energy transfers.

CNSCI 5101 Investigations in Space Science
3 credits
This course focuses on the study of the Universe-the totality of all space, time, matter, and energy. The organization of course content will take an “Earth Out” approach by studying the relatively familiar solar system before the discussion of stars and galaxies. Nature offers no greater splendor than the starry sky on a clear, dark night. Participants will make several “real time” observations that will extend over the duration of the course, such as: a moon journal, a sun journal, and seasonal star charts. They will also learn to use online resources, such as Google Sky, NASA resources, and numerous video clips to enhance their learning of space science concepts. The following topics will be explored: the history and tools of astronomy, the solar system, the Sun and stellar evolution, and Cosmology- the fate of the universe.

CNSCI 6104 Investigations in Particles, Fields and Waves
3 credits
Participants develop their understanding of the physics of fields and waves through guided inquiry. They investigate electricity, magnetism, sound, waves and light through observation, hands-on experimentation, simulation, video, graphical representations and discussions. Participants apply their understanding of the physics that lay beyond the range of our senses to everyday occurrences and devices. *Prerequisite (effective January 2014): EDSCI 6120*

EDSCI 5200 Engineering STEM Solutions
3 credits
This course focuses on the use of the engineering design process to solve problems within a science context integrating STEM content. Participants investigate case studies of real engineering problems in the field, bridge content to practice, and begin to visualize research in an interdisciplinary context. Through the use of technology and design, participants deepen analytical and problem solving skills. Teachers will also become familiar with engineering education applications and learn to modify for their classroom.

EDSCI 6120 Physics of Mechanics
3 credits
The course approaches the study of physics called Mechanics. The purpose of this course is threefold: (1) to extend understanding of key physics concepts through guided investigation, (2) to understand how physics concepts apply to everyday phenomena, and (3) to understand conceptual understanding of the physics of Mechanics and the strategies for addressing them. Through both hands-on experimentation and computer simulation, you will learn to investigate nature as a physicist does. *Prerequisite: CNSCI 5100 or EDSCI 5200*

EDSCI 6110 Life Science
3 credits
Biology is the prevalent crucial language used to describe and understand life. This course will immerse students in the words and stories interwoven in the landscape of life from ecosystems to cells. Biological knowledge from this course allows you to engage in the world, understand what is happening around you systemically, and join the conversation of life. More than ever before, it is incredibly important to be competent in the language of life as we continue to engage in activities that have myriad, far-reaching impacts. *Prerequisite: CNSCI 5100 or EDSCI 5200*

EDSCI 6115 Earth and Space Science
3 credits
Processes that operate on Earth, Earth's place in the solar system, and the universe will be explored. Using a "large scale to smaller scale" approach, we will study the vastness of the universe: its stars first, then the solar system, and finally Earth's systems. Additional systems to be explored include Earth materials, plate tectonics, water and Earth's surface processes, weather and climate, and bio-geology. *Prerequisite: CNSCI 5100 or EDSCI 5200*

Teaching English to Speakers of Other Languages

EECLD 6001 Culturally Responsive Teaching
3 credits
This course sets the foundation for creating meaningful and relevant teaching and learning for culturally and linguistically diverse students. Legal issues and a historical perspective are used to examine the student's civil rights and the ways that prejudice, culture, language diversity, and socioeconomic factors influence the student's academic success or lack of it within the current system and under the current policies. The cultures of the student's state are studied and used in planning and cultivating culturally responsive learning/instruction and positive cultural identity in the family and community relations. Intercultural communication at the local, national, and international level is addressed. Participants engage in self-study, write their own cultural and linguistic autobiography, identify and utilize cultural resources in the community, and plan to actively involve linguistically diverse families in the school environment.

EECLD 6002 Essential Linguistics: What Every Teacher Needs to Know about Language
3 credits
This course takes a practical approach to the study of linguistics and English as a new language with implications for teaching ESL, reading, writing, spelling, phonics, and grammar in monolingual or multilingual contexts. The basic nature of language, first language acquisition, language variation, language change, and the relations of language to society and culture are explored. The course focuses on the development of linguistic foundational knowledge elements such as phonology, morphology, syntax, and pragmatics that informs planning for teaching first or second language. Structural and semantic differences between the students first and English as a new language are examined and used in planning for learning.

EECLD 6004 First and Second Language Acquisition and Oral Development
3 credits
This course focuses on first and second language acquisition theories, research, and practice with special attention to the nature of second language learning in a multilingual, multicultural context. A primary focus of this course is on the development of effective culturally responsive and research based language learning strategies and engaging methods for listening and speaking in two or more languages. TESOL standards (2010) are used in lesson planning and evaluation of second language. Instructional materials, including realia and a variety of media, are also used. *Prerequisite: EECLD 6002 or EACLD 5500*

EECLD 6007 Teaching English to Speakers of Other Languages: Literacy and Literature
3 credits
This is a hands-on course dedicated to using outcome-based TESOL standards in multilingual/multicultural context for teaching reading, writing, and spelling in English to CLD students who are at different levels of English proficiency. Teachers acquire, evaluate, adapt, and develop materials that are responsive to the language proficiency level and cultural diversity of students in a classroom that fosters critical thinking skills and respect for all. Participants are expected to read, evaluate, and use a variety of K-8 children's literature and to learn to continuously assess and adjust their own language usage in the classroom in order to maximize student comprehension and verbal participation. *Prerequisite: EECLD 6002 or EACLD 5500*

EECLD 6010 Teaching English to Speakers of Other Languages: Content Areas
3 credits
This course explores various research-based approaches of using classroom inquiry, small and large group projects, and community involvement to integrate the subject area content of the state frameworks with TESOL standards. Issues of group development such as inclusion, influence, cultural identity, community, structure, and mediation that support achievement are addressed. Through simulation and analysis, students deepen their understanding of the underlying structure and process of each of the content disciplines in English as a new language. *Prerequisite: EECLD 6002 or EACLD 5500*

EECLD 6012 Assessment for Equity and Inclusion of CLD Learners: Linguistic/Cultural Differences and Disabilities
3 credits
Appropriate assessment is essential to understanding and documenting standards-based learning and the process of distinguishing learning disabilities from language differences. Second language proficiency assessment is the primary focus of this course. Participants gain the skills to administer language assessments, monitor progress, interpret results, and incorporate them into instruction. Potential linguistic and cultural biases in assessment instruments, including biases in standardized tests, are analyzed. Students are required to practice with alternative assessment measures, including portfolio and other authentic assessments. *Prerequisite: EECLD 6002 or EACLD 5500*