# Teaching, Learning, & Technology (TLT)

**Courses**

**TLT 350 Introduction to Learning Analytics 3 Credits**
Data-informed decision-making is essential for improving teaching and learning practices. This course is designed for anyone interested in using data to improve education and learning outcomes. This course will provide you with the skills and knowledge necessary to succeed in the growing field of learning analytics. This course covers the basics of learning analytics (LA), including LA concepts, models, frameworks, and techniques. We will also discuss key ethical considerations in LA, including privacy, security, and bias.

**TLT 351 Data Visualization 3 Credits**
Educators are currently expected to comprehend, process, and handle large quantities of datasets with a variety of data types. In this course, learners will be provided with opportunities to learn the concepts and skills of data visualization, manage real-life data visualization tasks, interpret visualization outcomes, and enhance their understanding of data-driven decision-making.

**TLT 352 Game-Based Learning 3 Credits**
Learning games are designed through a combination of instructional and motivational design principles. Through playful, hands-on experiences, this course will address the theory, practice, and development of learning games in education. Participants will produce and test student-developed learning games.

**TLT 365 Design Thinking for Learning 3 Credits**
In this project- and theory-based course, students will apply elements of design thinking to the development and production of curricular and instructional materials that support audience learning, engagement, and performance. Students will demonstrate knowledge, skills, and appropriate attitudes/beliefs [KSABs] in the design and development of a course-long project, group design challenge, and several project-based activities throughout the semester.

**TLT 367 (EVST 367) Environmental Education 3 Credits**
Introductory environmental education course designed to prepare students to implement environmental education opportunities in formal and non-formal education settings. Topics include history and philosophy of environmental education, environmental laws and regulations, GIS, environmental issues and decision making, curriculum integration and environmental education teaching methodologies. This is a Web enhanced containing both online and fieldwork components.

**TLT 368 (EVST 368) Teaching and Learning with Geospatial Tools 3 Credits**
Exploration of geospatial tools, including but not limited to global positioning systems (GPS), geographic information systems (GIS), and related visualization tools (e.g. Google Earth). Application of these tools and techniques to instructional settings, including appropriate pedagogy and assessment. Not available for credit for students who have completed EVST/TLT 369.

**TLT 369 (EVST 369) Applied Geospatial Tools 3 Credits**
Introduction to geospatial tools--including but not limited to global positioning systems (GPS), geographic information systems (GIS), and related visualization tools (e.g. Google Earth)--and related concepts such as geo-databases, map projection, and remote sensing. Application of these tools and techniques to research, policy, business, public health, and communications. Not available to students who have taken EVST/TLT 368.

**TLT 371 The Business, Social, and Education Entrepreneur 3 Credits**
Release your inner entrepreneur! This course offers an introduction to entrepreneurial thinking and action as applied to an innovative startup business, school initiative, or non-profit institution. The course is fully online, with asynchronous and synchronous sessions. Students will learn from case study exemplars across many fields that demonstrate the roles of creativity, planning, funding, and perseverance. Participants will learn by preparing a startup plan, writing sections throughout the course as the topics are studied.

**TLT 372 Online Teaching and Learning 3 Credits**
Examination of contemporary research on online learning and recognized best practices on the design and delivery of online, hybrid, and/or flipped courses or course modules. Emphasis on online activities to experience ways to maximize instructor presence and student engagement, collaboration, and achievement.

**TLT 380 Child Development and Cognition 3 Credits**
Introduction to physical, motor, perceptual, cognitive, language, emotional, social, and gender development of young children and adolescents. Developmental history, theories, and research, as well as the effect of culture, family, peers, media, and schooling on the individual and groups. Students investigate typical and atypical development and explore the implications of individual differences for teaching and learning, with an emphasis on evidence-based instructional practices designed to optimize the growth and development of all learners. Explores mental health issues and at-risk students.

**TLT 394 Special Topics in Education: 1-3 Credits**
Examination of a topic of research or professional interest in education. Subtitle will vary. May be repeated for credit as subtitle varies.
**Repeat Status:** Course may be repeated.

**TLT 401 Overview of Teaching and Learning 3 Credits**
Foundations and key concepts in learning and instructional theory. Cognition and brain-based research with a focus on innovations in teaching and learning.

**TLT 402 Reading and Writing for Research Publication 3 Credits**
Using literature to build persuasive written arguments. Searching and identifying promising sources, distilling research findings, synthesizing literature to support an argument, and organizing written materials to enhance persuasiveness. Suited to those writing qualifying projects, dissertation proposals, dissertations, funding proposals, conference proposals, and journal articles.

**TLT 403 Introduction to Instructional Design 3 Credits**
Social, cognitive, and environmental factors in designing for teaching and learning. Systems theory applied to learning settings. Special emphasis on motivational theories and technological affordances.

**TLT 404 (SPED 404) Cultural and Linguistic Diversity 3 Credits**
All teachers need to gain an understanding of how to support culturally and linguistically diverse students, particularly multilingual learners (MLs). This course explores the systemic disadvantage and bias MLs experience in the school system. It will offer best practices and concrete strategies that teachers can implement to challenge systemic disadvantages MLs face in classrooms and schools. With the understanding that students have complex identities and needs, throughout the course, the heterogeneity of culturally and linguistically diverse students will be emphasized.

**TLT 405 Principles and Applications of K-12 Assessment 3 Credits**
Assessment applied to learning in classroom learning environments, including universal screening and progress monitoring. Discusses assessment approaches, ways to implement assessment, and use of assessment tools to monitor all students, including ELL and students with disabilities. Use of data-management and grading systems. Addresses diagnostic assessments for student placement and analysis of assessment data to tailor instruction to diverse student needs. Emphasis on research-based practices of assessment to inform instructional decision-making consistent with the RtII framework.

**TLT 407 Instructional Design for K-12 Classrooms 3 Credits**
Introduces the systematic design of instruction following the Response to Instruction and Intervention (RtII) and Universal Design for Learning models. Explores theories of learning and instructional applications as a part of technology-based and standards-aligned classroom education grounded in the use of a quality, research-based core curriculum and effective instructional practices to meet the needs of all learners. Addresses appropriate use of instructional technologies for universal learning. Students will plan, design, and develop student-centered, standards-aligned, technology-supported instruction and appropriate learner assessments.

**TLT 409 (SPED 409) K-12 Classroom Environment and Management 3 Credits**
Designing inclusive classroom environments that maximize learning. Emphasis on fostering a positive learning environment using evidence-based classroom management strategies for all learners, including students with disabilities and those from culturally and linguistically diverse backgrounds. Addresses function-based thinking to understand behavior problems and identify appropriate interventions. Includes discussion of manifestation of both internalizing and externalizing problems and related interventions.

**TLT 411 (SPED 411) Early Childhood Education 3 Credits**
Introduction to development of early childhood education in the U.S. Emphasizes evidence-based methods and materials to assist young children in the learning process, including arrangement of indoor/outdoor space, developmentally appropriate practices, and the design of instruction to foster young children's emotional, social, language, cognitive, physical, and creative development. Includes embedded instruction and adaptations for students with identified disabilities, children at risk for developing disabilities, and children with culturally and linguistically diverse backgrounds, and family collaboration within the instructional planning process.

**TLT 412 Social Studies in PreK through 4th Grade 3 Credits**
Overview of Pennsylvania's PreK-4 Standards for social studies, including: Pennsylvania history, United States history, economics, civics and government, citizenship, political science/government, and geography. Development, implementation and evidence-based assessment of preK-grade 4 social studies curricula. Effective teaching techniques such as lesson planning, inclusive practices, integrating instructional technologies into instruction, reflecting on teaching, and the latest research-based teaching and assessment methods. Emphasis on alignment of instruction with standards.

**TLT 420 Literacy in PreK through 4th Grade: Reading and Its Foundations 3 Credits**
Knowledge of the theories, methods, and materials that can be used to teach reading and early reading skills in PreK-4th grade. Understanding of the skills of successful readers. Evidence-based practices in reading instruction and data-based decision-making to teach reading to all students, including students with disabilities and English learners. Strategies to partner with caregivers to enhance reading an early reading skills.

**TLT 422 Literacy in PreK through 4th Grade: Writing and Its Foundations 3 Credits**
Knowledge of the theories, methods, and materials that can be used to teach writing and foundational skills in PreK-4. Understanding of the developmental aspects of writing and the skills of successful writers. Evidence-based practices in writing instruction and data-based decision-making to teach writing to all students, including students with disabilities and English learners.

**TLT 426 Science in PreK through 4th Grade 3 Credits**
Overview of inquiry-based activities and investigations to promote science learning in preK-grade 4 classrooms. Emphasis on Pennsylvania's PreK-4 Standards for Science and Technology and Environment and Ecology standards and aligning instruction with standards. activities include planning effective lessons, trying out new methods of teaching, reflective practice, inclusionary methods, and integrating instructional technologies into science learning. Evidence-based assessment types are highlighted within instructional contexts.

**TLT 428 Mathematics and Numeracy in PreK through 4th Grade 3 Credits**
Trends, theories, activities and manipulative materials for teaching early numeracy and elementary mathematics. Pre-school development and in-school skills and concepts, including sets, systems of numeration, experience with numbers, number operations and concepts, numerals, measurement, early algebra, and elements of geometry. Implications of developmental differences and early non-school experiences on learner readiness and skills. Helping parents support their children's mathematics conceptual development. Research-based practices and inclusionary approaches to teach mathematics to learners from a variety of backgrounds and across ability levels.

**TLT 431 Social Studies in Middle Level and High School Education 3 Credits**
Middle and high school curriculum, content, teaching strategies, and instructional materials for the social studies. Emphasis on organizing content, using appropriate methods, testing and evaluation, and appropriate integration of technology. Overview of Pennsylvania's 4-8 and 8-12 standards for social studies and related standards from the National Council for the Social Studies and other national organizations. Explores relevant research, courses of study, textbooks, and teacher-made materials. Addresses inclusive evidence-based and standards-aligned instructional approaches and techniques, including co-teaching.

**TLT 432 Reading and Critical Thinking in Middle Level and High School Education 3 Credits**
Development of reading in the secondary content areas (English/language arts, mathematics, science, social studies). Highlights effective teaching strategies in critical areas, such as higher order reading and study skills. Addresses analysis of evidence based methods and current research for improving the reading development and analytical skills of all students.

**TLT 434 English in Middle Level and High School Education 3 Credits**
Curricula, philosophy, methods, strategies, and materials for the teaching of middle and high school English. Literature, genres, and the nature of text and text differences. Critical analysis and drawing inferences from narrative text and poetry. Techniques for teaching and enhancing writing in various styles. Applications of technology and assessment principles. Addresses inclusive evidence-based and standards-aligned instructional approaches and techniques, including co-teaching.

**TLT 436 Science in Middle Level and High School Education 3 Credits**
Overview of inquiry-based activities and investigations to promote science learning in secondary science classrooms. Emphasis on aligning instruction with Pennsylvania's Standards for Science and Technology and Environment and Ecology standards. activities include planning effective lessons, trying out new methods of teaching, inclusionary methods, reflective practice, and integrating instructional technologies into science learning. Evidence-based assessment types highlighted within instructional contexts.

**TLT 438 Mathematics in Middle Level and High School Education 3 Credits**
Standards-based and technology-intensive curricula, instructional activities, and manipulative aids for mathematics in middle level and high schools. This course models and explores an investigative and hands-on approach to secondary mathematics instruction. Particular attention given to learning theories, curriculum issues, and recommendations arising from state, national, and international assessments. Research-based practices and inclusionary approaches to teach mathematics to learners from a variety of backgrounds and across a range of abilities. Addresses standards-aligned instructional approaches and techniques, including co-teaching.

**TLT 440 Pre-professional Seminar 3 Credits**
Study, directed observation of, and initial practice in the various phases of teaching in secondary schools. Guided opportunities to try out strategies to facilitate the inclusion of special education students, differentiated instructional practices, and standards-aligned and evidence-based instructional approaches in actual school settings. Consent of program coordinator required.

**TLT 442 (SPED 442) General Education and Special Education Student Teaching and Seminar 4-6 Credits**
Intensive practice in the application of principles of teaching for both general and special education settings in a supervised internship in the schools (for dual certification). Regular meetings among student teachers for critical analysis and discussion of classroom instructional practices, as illustrated by the student teachers' experiences in the schools. Practical mentoring on professionalism, applying differentiated instructional models in real-world setting, and aligning instruction with standards. Consent of program director required.

**TLT 444 General Education Student Teaching and Seminar 3-6 Credits**
Intensive practice in the application of principles of teaching for general education settings in a supervised internship in the schools. Regular meetings among student teachers for critical analysis and discussion of classroom instructional practices, as illustrated by the student teachers' experiences in the schools. Practical mentoring on professionalism, applying differentiated instructional models in real-world setting, and aligning instruction with standards. Consent of program director required.

**TLT 450 Introduction to Learning Analytics 3 Credits**
Data-informed decision-making is essential for improving teaching and learning practices. This course is designed for anyone interested in using data to improve education and learning outcomes. This course will provide you with the skills and knowledge necessary to succeed in the growing field of learning analytics. This course covers the basics of learning analytics (LA), including LA concepts, models, frameworks, and techniques. We will also discuss key ethical considerations in LA, including privacy, security, and bias.

**TLT 451 Data Visualization 3 Credits**
Educators are currently expected to comprehend, process, and handle large quantities of datasets with a variety of data types. In this course, learners will be provided with opportunities to learn the concepts and skills of data visualization, manage real-life data visualization tasks, interpret visualization outcomes, and enhance their understanding of data-driven decision-making.

**TLT 454 Applied Instructional and Learning Design Principles 3 Credits**
Exploration and application of design models for learning. Special emphasis on the application of teaching and learning theories and instructional design strategies and models to design and develop authentic learning products or experiences, iterate projects, and reflect on personal preferences and processes as designers.
**Prerequisites:** TLT 403

**TLT 458 Introduction to Multimedia Programming and Development 3 Credits**
Introduction to programming and resource development tools used in the creation of interactive multimedia teaching and learning materials.

**TLT 460 Advanced Multimedia Programming and Development 3 Credits**
Advanced exploration of programming and resource development tools used in the creation of interactive teaching and learning materials.
**Prerequisites:** TLT 458

**TLT 461 Introduction to Artificial Intelligence in Education 3 Credits**
This course delves into the transformative world of Artificial Intelligence (AI) in education by exploring the history and current development of AI, its potential impact on various aspects of teaching and learning, and how educators can leverage AI tools effectively. Throughout the course, you will develop your AI literacy by understanding fundamental concepts, ethical considerations, and limitations. You will also gain hands-on experience with diverse AI tools applicable in various educational settings.

**TLT 462 Special Topics in Teaching, Learning, and Technology 1-3 Credits**
We know the field of teaching, learning, and technology is evolving at a rapid pace. This course focuses on innovations in teaching, learning, and technology.
**Repeat Status:** Course may be repeated.

**TLT 463 Building Makerspaces for Learning 3 Credits**
A Makerspace is both a space and a mindset. By encouraging play, design, tinkering, and creative inquiry, these spaces and mindsets can create transferable, high-order thinking skills, knowledge, and attitudes/beliefs about many topics. This course will discuss the fundamentals of why, what, where, and how to build and incorporate different types and "levels" of Makerspaces into any instructional setting.

**TLT 464 Digital Storytelling 3 Credits**
The art and practice of storytelling is assuredly almost as old as the advent of formal language itself, and for nearly all of that time, with few exceptions individual storytellers have been bounded within an analog framework. Recently, various digital tools have emerged (or have become more accessible) that facilitate digital storytelling, implications of which are potentially wide-ranging for technologists, educators, and students alike. This course will critically examine the comparatively nascent world of digital storytelling. We will first consider.

**TLT 465 Design Thinking for Learning 3 Credits**
In this project- and theory-based course, students will apply elements of design thinking to the development and production of curricular and instructional materials that support audience learning, engagement, and performance. Students will demonstrate knowledge, skills, and appropriate attitudes/beliefs [KSABs] in the design and development of a course-long project, group design challenge, and several project-based activities throughout the semester.

**TLT 466 Field Experience: General Education Certification 1-3 Credits**
Intensive practice in the application of principles of teaching in general education in a supervised experience in the schools for students who already hold special education certification. Practical mentoring on professionalism, applying differentiated instructional models in real-world setting, and aligning instruction with standards. Consent of the program director.

**TLT 467 Project-, Scenario-, & Simulation-Based Learning in Interactive Multimedia Environments 3 Credits**
This course focuses on the design, development, and implementation of authentic project-, scenario-, and simulation-based learning environments using interactive media. Students will apply various instructional design models, learning theories, and multimedia tools to create project-, scenario-, and simulation-based materials, visuals, and other digital media and assess the results. Students will explore story, character, and challenge design, choice creation, and consequence feedback loops to develop classroom or corporate, online, and mobile interactive learning environments.

**TLT 468 Game-Based Learning 3 Credits**
Learning games are designed through a combination of instructional and motivational design principles. Through playful, hands-on experiences, this course will address the theory, practice, and development of learning games in education. Participants will produce and test student-developed learning games.

**TLT 469 Applied Artificial Intelligence and Machine Learning for Education 3 Credits**
This course provides a comprehensive introduction to machine learning and its applications in the field of education. Through hands-on activities and practical explorations, students will gain the knowledge and skills to explore how machine learning can be used to improve teaching, learning, and assessment.

**TLT 470 Technology for Teaching and Learning 3 Credits**
Analysis of available technologies (hardware, software, and Web resources), and identification of technologies matched to learner needs in traditional and/or non-traditional settings.

**TLT 472 Online Teaching and Learning 3 Credits**
Examination of contemporary research on online learning and recognized best practices on the design and delivery of online, hybrid, and/or flipped courses or course modules. Emphasis on online activities to experience ways to maximize instructor presence and student engagement, collaboration, and achievement.

**TLT 474 Large-scale Planning and Implementation of Educational Technology 3 Credits**
Addresses topics such as planning, maintaining, funding, networking, staffing, staff development, and monitoring of educational technology implementations.

**TLT 475 Trends and Innovations in Instructional Technology 3 Credits**
Examination of current research and emerging trends in instructional technology with the goal of anticipating the development and diffusion of new practices in schools and school systems. As William Gibson famously said, “The future is here today, it’s just not evenly distributed.”

**TLT 476 Assessment of Instructional Technologies 3 Credits**
Techniques for evaluating technology implementations for teaching and learning. Focus on topics such as instrumentation, data collection and analysis, drawing conclusions from data sets, and preparing reports for stakeholders.

**TLT 477 Cognitive Theory and Technology Integration 3 Credits**
The spread of instructional technology systems and expanding knowledge of how we think and how learn has changed the ground beneath educators' feet. This course provides teachers with practical examples and frameworks for applying cognitive science and technology to benefit students through increased engagement, increased formative evaluation, and more.

**TLT 478 School Leadership in the Digital Age 3 Credits**
Successful implementation of any initiative in schools is contingent on support from leadership, whether it be administrators or teacher leaders. This course will focus on the characteristics of good leadership and how they may be applied in successful technology integration strategies. Concepts will be explored around creating an environment of equity through digital access, being a champion for personalized learning, and building a collaborative ecosystem of support.

**TLT 479 Technology Integration Coaching 3 Credits**
Instructional technology coaches work collaboratively with peer teachers to improve teaching, with a focus on the appropriate and effective uses of educational technologies. Practices include identifying a baseline of practices and habits of mind, setting meaningful goals for integration based on resources and student needs, assisting teachers in developing technology literacy, aiding teachers in integration, and providing ongoing support for success. This course will investigate the basic tenets of instructional coaching and then delve into evidence-based strategies for content-area instruction.

**TLT 480 Curriculum Theory and Design 3 Credits**
Curricular models and their features, with a focus on curriculum development and enactment. Special emphasis on design principles, curriculum’s role in K-12 settings, and technology-enhanced curriculum.

**TLT 482 Practicum in University Teaching: Teaching, Learning & Technology 1-4 Credits**
Mentored and guided co-teaching focused on the design, organization, pedagogy and assessment of university courses in Teaching, Learning and Technology. Students in this course will work with a faculty member to apply best practices in university teaching with feedback while co-teaching students in a course in the College of Education. Students taking the course must meet the college standards for participation and be approved by the program director and department chair. May be repeated for credit.
**Repeat Status:** Course may be repeated.

**TLT 483 Diversity and Multicultural Perspectives in International Education 3 Credits**
Examination of the influence of culture, gender, and disabilities on behavior and attitudes. Historical and current perspectives on race,culture, gender, sexual orientation, gender identity diversity, and minority group issues in education and psychology. The primary context of application is contemporary international education.

**TLT 485 Doctoral Research Project Seminar 3 Credits**
The purpose of this course is to guide students in their independent doctoral research projects. While planning for or engaging in their independent doctoral research projects, students will gain competencies in the writing process, methodological design and analysis, and data collection.
**Repeat Status:** Course may be repeated.

**TLT 486 Doctoral Research Project I: Design & Development 3 Credits**
This course provides students with the opportunity to design and develop research studies under the supervision of specific faculty.
**Repeat Status:** Course may be repeated.

**TLT 487 Doctoral Research Project II: Implementation, Analysis, & Writing 3 Credits**
This course provides students with the opportunity to implement, analyze, and write-up research studies under the supervision of specific faculty.
**Repeat Status:** Course may be repeated.

**TLT 492 Classroom Research Methods 3 Credits**
Introduces students to classroom research design paradigms and the assumptions behind them, use of the literature, developing research questions, qualitative and quantitative procedures, research design, sampling design, data collection, data analysis, and reporting research results using educational applications.

**TLT 494 Culminating Research Project 3 Credits**
Designing and conducting research projects in classroom settings.

**TLT 499 Dissertation 1-15 Credits**