Teaching, Learning, and Technology

Teaching, Learning, and Technology (TLT) Program offers four master's degrees and two graduate certificates, focused in two primary areas: teacher education and instructional technology/learning design. The program also offers a doctoral degree.

The master's degrees in preservice teacher education are Master of Education in Elementary Education and PreK-Grade 4 Teacher Certification, Master of Education in Secondary Education and Grades 7-12 Teacher Certification. Undergraduate students at Lehigh may also enroll in the 4 + 1 accelerated Master's where they receive their Master of Education in Elementary Education and PreK-Grade 4 Certification or Master of Education in Secondary Education and Grades 7-12 Teacher Certification, in addition to their Bachelor's degree. Teacher education students may elect to extend their coursework to earn additional certification/endorsement in Special Education, English as a Second Language program specialist PreK-12, and/or Social-Emotional-Behavioral Wellness endorsement. All teacher certification programs have been approved by the Pennsylvania Department of Education, making graduates eligible for initial certification in Pennsylvania.

For in-service teachers or individuals seeking to learn how to educate in informal contexts, TLT offers several Master's degrees and certificates:

The Master of Education in Teaching and Learning prepares educators (broadly defined) who want to learn the foundations of teaching and learning as well as innovative pedagogical strategies. This degree can be customized to a particular area of emphasis, such as technology and design, innovative pedagogy, English as a Second Language, or social-emotional-behavioral wellness.

TLT also offers a Master of Science in Instructional Technology which prepares educators (broadly defined) to integrate instructional technology more effectively in a variety of contexts.

Certificates (12 credits) are also available in: Learning Design in Schools and Professional Settings as well as Game-Based Learning.

Finally, the program offers a Doctor of Philosophy in Teaching, Learning, and Technology, which spans fields of learning design, instructional technology, and teacher education.

The TLT program prepares professional educators, technologists, and designers through a combination of graduate-level education and certification experiences. The program highlights research-based, inquiry-oriented, and technology-enabled strategies to reach all learners. We emphasize collaborative and equitable approaches to instruction and learning. TLT graduates are scholars, highly skilled practitioners, and leaders in their professional communities.

Upon completion, TLT graduates become teachers in PreK-12 schools; curriculum coordinators, coaches, and educational technology specialists in both formal and informal education settings; instructional or learning designers and/or technologists; or faculty in higher education institutions.

For more information about our Master's Degrees:

https://ed.lehigh.edu/academics/degrees/masters-degrees (https://ed.lehigh.edu/academics/degrees/masters-degrees/)

For more information about our certificates:

https://ed.lehigh.edu/academics/degrees/certificates (https://ed.lehigh.edu/academics/degrees/certificates/)

For more information about our doctoral degree:

https://ed.lehigh.edu/academics/degrees/doctoral-degrees (https://ed.lehigh.edu/academics/degrees/doctoral-degrees/)

4+1 Bachelor's Plus Accelerated Master of Education in Elementary Education and PreK-4 Certification

The College of Education offers a five-year degree program that is designed to allow students to earn both a bachelor's degree and a master's degree in five years instead of the traditional six. The combined degree program leads to either a B.A. or B.S. degree in an academic discipline from the College of Arts and Sciences, the P.C. Rossin College of Engineering and Applied Sciences, or the College of Business, and an M.Ed. degree in Elementary Education. In addition, students also earn eligibility for an Instructional I teaching certificate from the Pennsylvania Department of Education (PDE) in grades PreK-4.

PROGRAM OF STUDY FOR PREK-4 CERTIFICATION:

B.A. or B.S. plus Master of Education (M.Ed.) in Elementary Education and PA Certification eligibility. This 42-credit (minimum) master's program prepares students for certification as PreK-4 teachers. Students complete coursework in three categories:

Core Course Work (21 credit hours)

SPED 332	Introduction to Inclusion and Exceptional Education	3
TLT 380	Child Development and Cognition	3
TLT 404	Cultural and Linguistic Diversity	3
TLT 405	Principles and Applications of K-12 Assessment	3
TLT 407	Instructional Design for K-12 Classrooms	3
TLT 409	K-12 Classroom Environment and Management	3
TLT 411	Early Childhood Education	3

Development of Professional Skills (18 credit hours)

TLT 412	Social Studies in PreK through 4th Grade	3
TLT 420	Literacy in PreK through 4th Grade: Reading and Its Foundations	3
TLT 422	Literacy in PreK through 4th Grade: Writing and Its Foundations	3
TLT 426	Science in PreK through 4th Grade	3
TLT 428	Mathematics and Numeracy in PreK through 4th Grade	3
SPED 465	Advanced Inclusionary Practices in K-12	3

Extended Field Experience (3-6 credit hours)

TLT 444	General Education Student Teaching and Seminar	1-6

In order to be eligible for PreK-4 certification, by the time a student finishes the program he or she must have demonstrated competence in the core content areas for that certification. At time of acceptance, each student will be informed of any additional content-area coursework he or she will be required to complete in order to demonstrate competence in the PreK-4 core content areas. The student is responsible for completing this coursework prior to applying for PreK-4 certification. The credits for this coursework are not included in the master's degree.

Distribution of coursework across undergraduate and graduate study:

Sophomore Year (3 credit hours)

Junior Year (3 credit hours)

Senior Year (12 credit hours)

College of Education - Summer (12 credits)

College of Education - Fall (9 credits)

College of Education - Spring (3-6 credits)

Students in the 5-year program will take 18 credits pre-bachelor's and an additional 27 credits post-bachelor's. However, the University requires that master's degrees carry at least 30 credits minimum. This means students in the 5-year program must have at least 3 credits "left over" from their bachelor's program to move across to the College of Education to put toward their master's degree.

4+1 Bachelor's Plus Accelerated Master of Education in Secondary Education and Teacher Certification

The College of Education offers a five-year degree program that is designed to allow students to earn both a bachelor's degree and a master's degree in five years instead of the traditional six.

The combined degree program leads to (1) a B.A./B.S. degree in an academic discipline from the College of Arts and Sciences, the P.C. Rossin College of Engineering and Applied Sciences, or the College of Business, and (2) an M.Ed. degree in Secondary Education. In addition, students also earn eligibility for Instructional I teacher certification from the Pennsylvania Department of Education (PDE) in one of the 8 subject areas below:

- Biology 7-12
- Chemistry 7-12
- Earth and Space Science 7-12
- English 7-12
- General Science 7-12
- Mathematics 7-12
- Physics 7-12
- Social Studies 7-12

PROGRAM OF STUDY:

B.A. or B.S. plus Master of Education (M.Ed., 33 credits minimum) and Pennsylvania teacher certification eligibility. In addition to meeting the requirements for the bachelor's degree, students must satisfy the Pennsylvania Department of Education guidelines for demonstrated content-area competence (see below).

Students complete coursework in three categories:

Core Coursework (15 credits)		
SPED 332	Introduction to Inclusion and Exceptional Education	3
TLT 404	Cultural and Linguistic Diversity	3
TLT 405	Principles and Applications of K-12 Assessment	3
TLT 407	Instructional Design for K-12 Classrooms	3
TLT 409	K-12 Classroom Environment and Management	3
Development of Professional Skills (12 credits)		
Content-area teaching methods course with approval of adviser (one of the following):		
TLT 431	Social Studies in Middle Level and High School Education	3
TLT 434	English in Middle Level and High School Education	3
TLT 436	Science in Middle Level and High School Education	3
TLT 438	Mathematics in Middle Level and High School Education	3
Plus:		
TLT 432	Reading and Critical Thinking in Middle Level and High School Education	3
SPED 465	Advanced Inclusionary Practices in K-12	3
TLT XXX Elective with adviser approval		3
Extended Field Experiences (6-9 credits)		
TLT 440	Pre-professional Seminar	3
TLT 444	General Education Student Teaching and Seminar	1-6

In order to be eligible for secondary certification, by the time a student finishes the program he or she must have demonstrated competence in the subject matter area of that certification. Each student upon admission meets with the content-area specialist in the field in which that student seeks secondary certification. The content-area specialist, who is a faculty member in the College of Arts and Sciences, reviews the student's transcripts and compares that student's coursework with the content-area guide sheet approved by the Pennsylvania Department of Education (PDE). Following this audit, the content-area specialist will identify what additional coursework in the content-area is needed, if any. The student is responsible for completing this coursework prior to applying for secondary certification. The credits for this course work are not included in the M.Ed. degree.

Students in the secondary teacher-preparation program are expected to have completed almost all their content area coursework prior to going out to student teach. This is important because student teachers need to have mastery of their content in order to fulfill their responsibilities to their students and to derive maximum benefit from the student teaching experience.

Distribution of coursework across undergraduate and graduate study:

Sophomore Year (3 credit hours)

Junior Year (6 credit hours)

Senior Year (6 credit hours)

College of Education - Summer (6 credits)

College of Education - Fall (9 credits)

College of Education - Spring (3-6 credits)

Students in this program unable to accrue enough credits outside their undergraduate degree programs may need to take additional credits after beginning graduate study in order to reach the 33-credit minimum.

Students in this program who wish to obtain the Master of Arts (M.A.) degree rather than the M.Ed. degree may petition to change to that degree after admission to graduate study. The M.A. degree requires 42 credits instead of 33 credits and has specific content-area expertise requirements. See the M.A. degree description for its requirements.

MASTER OF EDUCATION IN ELEMENTARY EDUCATION AND PREK-4 TEACHER CERTIFICATION

This 42-credit (minimum) program prepares students for Pennsylvania Level I certification as PreK-4 teachers and leads to the awarding of a master's degree in Elementary Education. Students complete coursework in three categories:

Core Course Work (21 credit hours)		
SPED 332	Introduction to Inclusion and Exceptional Education	3
TLT 380	Child Development and Cognition	3
TLT 404	Cultural and Linguistic Diversity	3
TLT 405	Principles and Applications of K-12 Assessment	3
TLT 407	Instructional Design for K-12 Classrooms	3
TLT 409	K-12 Classroom Environment and Management	3
TLT 411	Early Childhood Education	3
Development of Professional Skills (18 credit hours)		
TLT 412	Social Studies in PreK through 4th Grade	3
TLT 420	Literacy in PreK through 4th Grade: Reading and Its Foundations	3
TLT 422	Literacy in PreK through 4th Grade: Writing and Its Foundations	3
TLT 426	Science in PreK through 4th Grade	3
TLT 428	Mathematics and Numeracy in PreK through 4th Grade	3
SPED 465	Advanced Inclusionary Practices in K-12	3

Extended Field Experience (3 credit hours)

TLT 444	General Education Student Teaching and Seminar	1-6

Thirty (30) credits minimum is required for the master's degree. In order to be eligible for PreK-4 certification, by the time a student finishes the program he or she must have demonstrated competence in the core content areas for that certification (English, mathematics, science, social studies). At time of acceptance, each student will be informed of any additional content-area coursework he or she will be required to complete in order to demonstrate competence in the PreK-4 core content areas (language arts, mathematics, science and social studies). The student is responsible for completing this coursework prior to applying for PreK-4 certification. The credits for this coursework are not included in the master's degree.

MASTER OF EDUCATION IN SECONDARY EDUCATION AND TEACHER CERTIFICATION

This 33 credit (minimum) program of study prepares students for Pennsylvania Level I certification as secondary content-area teachers in one of the subject areas (below) and leads to eligibility for a master's degree in secondary education:

- Biology 7-12
- Chemistry 7-12
- Earth and Space Science 7-12
- English 7-12
- General Science 7-12
- Mathematics 7-12
- Physics 7-12
- Social Studies 7-12

Students complete coursework in three categories:

Core Coursework (15 credit hours)

SPED 332	Introduction to Inclusion and Exceptional Education	3
TLT 404	Cultural and Linguistic Diversity	3
TLT 405	Principles and Applications of K-12 Assessment	3
TLT 407	Instructional Design for K-12 Classrooms	3
TLT 409	K-12 Classroom Environment and Management	3

Development of Professional Skills (12 credit hours)

Content-area teaching methods course with approval of your adviser (one of the following):		
TLT 431	Social Studies in Middle Level and High School Education	3
TLT 434	English in Middle Level and High School Education	3
TLT 436	Science in Middle Level and High School Education	3
TLT 438	Mathematics in Middle Level and High School Education	3
Plus:		
TLT 432	Reading and Critical Thinking in Middle Level and High School Education	3
SPED 465	Advanced Inclusionary Practices in K-12	3
TLT XXX Elective with adviser approval		3

Extended Field Experiences (6 credit hours)

TLT 440	Pre-professional Seminar	3
TLT 444	General Education Student Teaching and Seminar	1-6

In order to be eligible for secondary certification, by the time a student finishes the program he or she must have demonstrated competence in the subject matter are of that certification. Each student upon admission meets with the content-area specialist in the field in which that student seeks secondary certification. The content-area specialist, who is a faculty member in the College of Arts and Sciences, reviews the student's transcripts and compares that student's coursework with the content-area guide sheet approved by the Pennsylvania Department of Education (PDE). Following this audit, the content-area specialist will identify what additional coursework in the content-area is needed, if any. The student is responsible for completing this coursework prior to applying for secondary certification. The credits for this course work are not included in the M.Ed. degree.

Students in the secondary teacher-preparation program are expected to have completed almost all their content area coursework prior to going out to student teach. This is important because student teachers need to have mastery of their content in order to fulfill their responsibilities to their students and to derive maximum benefit from the student teaching experience.

Master of Education in Teaching and Learning

The goal of the master's in Teaching and Learning is to enhance practicing educators' evidence-based pedagogical knowledge and skills to optimize their design of classroom learning environments, including developing and implementing innovative curricula and learning activities. Different specialization tracks are available based on students' areas of interests, with some specializations linking to additional Pennsylvania Department of Education certifications/ endorsements.

Core Coursework (15 credits)

EDUC 403	Research	3
EDUC 471	Diversity and Multicultural Perspectives	3
TLT 401	Overview of Teaching and Learning	3
TLT 403	Introduction to Instructional Design	3
TLT 480	Curriculum Theory and Design	3

Electives (15 credits; select courses from the tracks below)

Track 1: Technology and Design		
TLT 368	Teaching and Learning with Geospatial Tools	3
TLT 369	Applied Geospatial Tools	3
TLT 458	Introduction to Multimedia Programming and Development	3
TLT 460	Advanced Multimedia Programming and Development	3
TLT 462	Special Topics in Development of Instructional Resources and Technologies for Learning	1-3
TLT 476	Assessment of Instructional Technologies	3
Or other electives as approved by advisor		
Track 2: Innovative Pedagogy		
TLT 367	Environmental Education	3
TLT 464	Digital Storytelling	3
TLT 465	Design Thinking for Learning	3
TLT 467	Project-, Scenario-, & Simulation-Based Learning in Interactive Multimedia Environments	3
TLT 468	Game-Based Learning	3
Or other electives as approved by advisor		
EDUC 391	Educational Linguistics	3
Track 3: English as a Second Language (if complete all coursework, eligible students may apply for a PDE certification)		
TLT 404	Cultural and Linguistic Diversity	3
EDUC 419	Second Language Acquisition	3
EDUC 420	Contemporary Issues in Multilingual Learner Education	3

EDUC 423	Curriculum and Materials Design for Multilingual Learners	3
Track 4: Social-Emotional Behavioral Wellness (if complete all coursework, eligible students may apply for a PDE endorsement)		
EDUC 406	Social Emotional Learning in Context	3
EDUC 431	Multi-Tiered Systems of Social-Emotional Support	3
EDUC 434	Prevention and Management of Crisis	1
EDUC 435	Implementation for Equity: Leading Student-Centered Schools	1
EDUC 436	Implementation for Equity: Social Emotional Learning in Action	1
EDUC 456	Trauma and Resilience in Schools	3

Master of Science in Instructional Technology

A thirty-credit masters degree offered through the Teaching, Learning, and Technology program. The program is aimed at those interested in the use of technology in education, particularly preK-12 and post secondary settings.

The 30-credit Master of Science in Instructional Technology program focuses on the planning and use of instructional technology in preK-12 and post secondary settings and non-formal learning environments (such as museums and science centers). The program is targeted toward individuals from varied backgrounds who wish to help educators or learn themselves to design, develop, and incorporate technology applications more effectively in diverse educational settings including preK-12, post secondary education, and informal learning environments. This is an appropriate degree for those who teach in the classroom and online, technology specialists, informal educators, and others interested in effectively using information and communications technologies to enhance instruction.

The program is designed to help develop skills that can be used to create new curriculum and learning activities to meet the demands of a changing technological society and the needs of new generations of students. As such, graduates may be designing online courses, enhance existing curriculum with emerging technologies, or may work as technology specialists, assisting with the integration of technology in academic and informal learning environments. The Instructional Technology graduate program is intended for both current professionals in the education field as well as those who are seeking an advanced degree to upgrade their skills and knowledge base related to technology.

College Core Requirements (3 credits)

EDUC 471	Diversity and Multicultural Perspectives	3

Program Core Requirements (15 credits)

TLT 401	Overview of Teaching and Learning	3
TLT 403	Introduction to Instructional Design	3
TLT 458	Introduction to Multimedia Programming and Development	3
TLT 460	Advanced Multimedia Programming and Development	3
TLT 476	Assessment of Instructional Technologies	3

Electives (pick 4 for 12 credits)

TLT 367	Environmental Education	3
TLT 368	Teaching and Learning with Geospatial Tools	3
TLT 462	Special Topics in Development of Instructional Resources and Technologies for Learning	1-3
TLT 470	Technology for Teaching and Learning	3
TLT 474	Large-scale Planning and Implementation of Educational Technology	3
TLT 480	Curriculum Theory and Design	3
EDUC 493	Internship in: (with subtitle)	1-6
Other electives as approved by advisor		0-6

Master of Science in Teaching, Learning, and Technology

The master of science in Teaching, Learning, and Technology is a 30-credit master's program. The TLT M.S. is available ONLY to students previously admitted to the TLT Ph.D. program and specifically those students who are NOT completing their doctorate. This MS is provided solely for those students who have completed the core coursework (i.e., 30 or more credits completed, including 12 credits in Foundations, 3 credits in Research, and 15 credits from other courses listed and/or through directed research) but are unable to progress through the culminating research projects of a doctoral degree. There is no thesis requirement for this master of science; it is a coursework-only masters. Awarding of such degree shall be dependent upon the student meeting all relevant university and College of Education requirements for master's degrees.

Doctor of Philosophy in Teaching, Learning, and Technology

A 48-credit, post-master’s doctoral degree offered through the Teaching, Learning, and Technology program.

The doctorate in Teaching, Learning, and Technology (TLT) is a 48-credit, post master's Ph.D. program. The TLT Ph.D. program employs a scientist/practitioner model of learning. That is, research is not separate from application or practice. Our doctoral students collaborate closely with faculty to generate new theories and classification systems, innovative curricula, technology-integrated learning environments, authentic approaches to assessing learning, and a wide range of creative methods of teaching and learning in a global world highly interconnected by technology.

In keeping with the scientist/practitioner model, our doctoral students learn through innovative approaches, including research-based strategies for curriculum delivery, synchronous and asynchronous environments, and a wide range of other technology-enhanced designs and approaches for learning. Students take about 42 credits of coursework in addition to their qualifying examination preparation, doctoral research project, and dissertation project. Coursework is individualized according to the concentration students decide to pursue. Also, many of the course assignments are project-based, which will allows students to apply concepts they are learning to their particular area of interest. In addition, the choice of research topic and projects is also up to the student --in consultation with his/her faculty adviser and within the broader context of the field, of course.

Foundations (12 credits)

Required:		
EDUC 471	Diversity and Multicultural Perspectives	3
TLT 401	Overview of Teaching and Learning	3
TLT 402	Reading and Writing for Research Publication	3
TLT 403	Introduction to Instructional Design	3

Research (12 credits)

Required:		
EDUC 403	Research	3
EDUC 408	Introduction to Statistics	3
EDUC 409	Analysis of Experimental Data	3
Electives (select at least one):		
EDUC 405	Qualitative Research Methods	3
EDUC 410	Univariate Statistical Models	3
EDUC 411	Multivariate Statistical Models	3
EDUC 412	Advanced Applications of Psychometric Principles	3
EDUC 461	Single-Subject Research Design	3
Other statistical research course in TLT, COE, or A&S as approved by adviser.		

Additional courses as required by adviser.

Professional Cognate (12 credits)

Required:		
TLT 480	Curriculum Theory and Design	3
Electives:		
EDUC 491	Advanced Seminars: (with subtitle)	1-6
EDUC 493	Internship in: (with subtitle)	1-6
EDUC 496	Doctoral Research Seminar	3
TLT 458	Introduction to Multimedia Programming and Development	3
TLT 460	Advanced Multimedia Programming and Development	3
TLT 462	Special Topics in Development of Instructional Resources and Technologies for Learning	1-3
TLT 470	Technology for Teaching and Learning	3
TLT 474	Large-scale Planning and Implementation of Educational Technology	3

Other learning and instruction elective course in TLT, COE, or CAS as approved by adviser.

Supervised Research Projects (6 credits minimum)

Required:		
TLT 486	Doctoral Research Project I: Design & Development	3
TLT 499	Dissertation	1-15
Electives:		
EDUC 493	Internship in: (with subtitle)	1-6
EDUC 494	Field Work in: (with subtitle)	3
EDUC 495	Independent Study in: (with subtitle)	1-6

Additional topic seminars, dissertation proposal or maintenance of candidacy, or elective with permission of adviser.

Professional Sub-Specialty (6 credits)

These credits are intended to advance the students' research agenda or career goals (such as a enhanced subject matter knowledge, mentored field/practical experiences with outreach programs, specialized coursework, college teaching, grant writing, and the like) with adviser approval.

Learning Design for Educational and Professional Settings certificate

Lehigh's 12-credit Certificate program is aimed at post-certification in-service teachers, informal educators, and other professionals seeking to expand their skills and knowledge of learning design and instructional technology. Professionals enrolled in the program will learn best practices in how to design and develop personalized instruction as well as implement and integrate new and emerging instructional technologies to enhance learning outcomes for youth and adults in a variety of educational settings, including informal learning environments.

Game-Based Learning certificate

This four-course certificate is aimed for educators who are seeking ways to infuse innovative game-based pedagogy into their formal or informal educational settings. Students will gain a rich understanding of cognition and instructional design that provide the foundation of these engaging teaching strategies.

Artificial Intelligence and Learning Analytics for Education Certificate

This 12-credit graduate certificate program will allow educators, researchers, and developers to expand their skills with artificial intelligence (AI) and learning analytics for use in a variety of educational settings. Students will have the opportunity to explore learning theories and data visualization techniques, access and manage AI systems, and apply their understandings and skills in selected field settings.

TLT 450	Introduction to Learning Analytics	3
TLT 451	Data Visualization	3
TLT 461	Introduction to Artificial Intelligence in Education	3
TLT 469	Applied Artificial Intelligence and Machine Learning for Education	3

Courses

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 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 391 Workshops 1-3 Credits
Cooperative study of current educational problems. Provides elementary, secondary, and special education teachers an opportunity to work at their own teaching levels and in their own fields. Limited to six credits during a summer session but the student may register for more than one workshop provided there is no duplication in subject matter.
Repeat Status: Course may be repeated.

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 (SPED 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 410 The Writing Process 3 Credits
Developmental characteristics of children's writing and relationships among writing, spelling and reading. Predictors of writing achievement, teaching strategies and activities, and evaluation schemes will be emphasized, K-12.

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 424 Children's Literature in Elementary Education 3 Credits
Role of literature in the instructional program of the elementary schools. Use of trade books for individualized instruction in reading, language arts, mathematics, science, and social studies.

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 456 Instructional Design and Development Studio 3 Credits
Studio-based, authentic and collaborative design experiences led by a faculty mentor. Students work in teams to complete substantial multimedia design and development projects.
Prerequisites: TLT 454 and TLT 460

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 Artificial Intelligence and Machine Learning for Education 3 Credits
Most educated people are mystified by artificial intelligence and machine learning. This course demystifies these emerging technologies through simple theory and hands-on experience. We will build AI and machine learning systems and apply them to tasks in teaching, learning, and administration. We will compare our understanding of machine learning with human learning, and we will extrapolate the state of technology today to the changes we can expect to see in the near future in education, economics (jobs), and daily life.

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 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