Teacher Preparation: Elementary and Secondary Education

Students seeking initial teacher certification may earn a Master of Education in Elementary Education with PreK-Grade 4 Teacher Certification or a Master of Education in Secondary Education with Grades 7-12 Teacher Certification. Students wishing to earn dual certification in both general education and special education may earn their master's degree and acquire such dual certification by completing additional courses in Special Education. Special education certification is PreK-12th grade. Students may also complete additional courses to add an English as a Second Language program specialist (PreK-12) certification or an endorsement in Social, Emotional and Behavioral Wellness.

Lehigh Undergraduate students are able to apply to the College of Education to take courses at the undergraduate level that will lead to a 4-year Bachelor's degree plus a Master's at the end of the fifth year. The Teaching, Learning, and Technology (TLT) Program offers a 4 + 1 accelerated Master's where students 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 along with their undergraduate degree. After approval, undergraduates are permitted to take selected courses while completing their undergraduate degrees. Following graduation, in an additional year, these students complete the remaining coursework toward teacher certification and a Master's degree.

Lehigh undergraduates who did not participate in our 4+1 program, as well as students who have graduated from other institutions with at least a Bachelor's degree, may also earn their teacher certification as part of a Master's degree.

Courses toward initial teacher certification are taught by faculty from Teaching, Learning, and Technology Program and the Special Education Program. Our preparation programs highlight evidence-based, strengths-focused, and technology-enabled strategies to reach all learners. We emphasize collaborative and equitable approaches to instruction and learning.

Lehigh's College of Education is accredited by the Pennsylvania Department of Education (PDE) to offer 10 teacher certifications along with the ESL Program Specialist PK-12 and the Social Emotional Behavioral Wellness endorsement:

- Elementary Education (Grades PreK-4);
- Eight Secondary (7th-12th grade) certifications: Biology, Chemistry, Earth and Space Science, English, General Science, Mathematics, Physics, and Social Studies; and
- Additional certifications and endorsements may be earned, at the same time and/or after students earn their general education certification: Special Education PreK-12 certification; English as a Second Language program specialist PreK-12 certification; Social, Emotional and Behavioral Wellness.

Pennsylvania has signed an Interstate Agreement with most other states/jurisdictions based upon mutually agreed-upon conditions. The contract provides for acceptance of state-approved educator preparation programs between certain states to facilitate educator mobility.

The College of Education also has relationships with international schools all over the world, enabling new teacher graduates to pursue teaching opportunities abroad.

For additional information about the program, please visit: https://ed.lehigh.edu/academics/program-explorer?facets_query=&f%5B0%5D=program_type%3A9

Master of Education in Elementary Education and PreK-4 Teacher Certification

This 30 credit (minimum) program of study prepares students for Pennsylvania Level I certification as PreK-4th grade teachers. To earn Pennsylvania certification, students must take all courses as required by the Pennsylvania Department of Education for their intended certification.

Required Coursework for General Education PreK-4 Certification

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	3-6
Additional Courses for Special Education Certification PreK-12		
SPED 418	Alternative Curricular Approaches	3
SPED 419	Intensive Intervention in Reading	3
SPED 421	Intensive Intervention in Mathematics and Content Area Literacy	3
SPED 423	Supporting Transition for Individuals with Disabilities	3
SPED 432	Positive Behavior Support	3
SPED 452	Assessment in Special Education	3
substitute TLT 442 (4-6 credits) for TLT 444		

Master of Education in Secondary Education and Teacher Certification

This 30-credit (minimum) Master's program prepares students for Pennsylvania Level I certification as secondary teachers in one of the content areas listed below. To earn Pennsylvania certification, students must take all courses as required by the Pennsylvania Department of Education for their intended certification.

- 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	3-6
Additional Courses for Special Education Certification PreK-12		
SPED 418	Alternative Curricular Approaches	3
SPED 419	Intensive Intervention in Reading	3
SPED 421	Intensive Intervention in Mathematics and Content Area Literacy	3
SPED 423	Supporting Transition for Individuals with Disabilities	3
SPED 432	Positive Behavior Support	3
SPED 452	Assessment in Special Education	3
substitute TLT 442 (4-6 credits) for TLT 444		

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.

Special Education Courses

SPED 330 Special Topics in Special Education 1-3 Credits
Current issues in the education of individuals with special needs. Titles vary.
Repeat Status: Course may be repeated.

SPED 332 Introduction to Inclusion and Exceptional Education 3 Credits
Overview of social, developmental, legal, and educational issues and practices related to the special education of individuals with disabilities. Covers social, environmental, and physiological etiology; development; identification; learning characteristics; and needs of individuals identified for special education. Emphasizes meeting diverse needs of students in general education classrooms through evidence-based practices and adaptations matched to learner needs. Addresses legal rights of students and their families, as well as legal responsibilities of teachers as required by IDEIA and other related special legislation.

SPED 338 Emotional and Behavioral Disorders of Children 3 Credits
Definition, classification, etiology, treatment, and historical perspective of children and adolescent disorders.

SPED 402 (SCHP 402) Applied Behavior Analysis 3 Credits
Theory and application of behavior modification methods in classroom and clinical settings. Topics include behavior analysis, outcome research, task utilization, and single case research.

SPED 404 (TLT 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.

SPED 408 Basic Principles of Behavior 3 Credits
This course examines the core concepts of applied behavior analysis. Principles describing the influence of environmental events on behavior change and strategies that can be applied to make behavior change socially meaningful in school, home, and community settings will also be covered. Topics include respondent and operant conditioning, reinforcement, punishment, extinction, stimulus discrimination, motivation operations, verbal behavior, and imitation and observational learning.
Repeat Status: Course may be repeated.

SPED 409 (TLT 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.

SPED 410 Behavior Analysts: Ethics and Professional Conduct 3 Credits
This course is designed to provide students an in-depth review of the BACB Professional and Ethics Compliance Code for Behavior Analysts and other relevant content and readings that further support student understanding of the topic area. Class discussions, review of case studies, and student-lead small group problem-solving activities will enable students to apply ethical and professional standards to their work, further promoting quality interactions between the children and adults they serve, families, teachers, and others stakeholders.

SPED 411 (TLT 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.

SPED 412 Organizational Behavior Management 3 Credits
This course provides an introduction to organizational behavior management (OBM). Students will learn how to assess work environments and implement function-based antecedent and consequent interventions with the goal of improving employee performance and business outcomes. Topics include performance analysis and management, supervision, staff training, behavioral systems analysis, organizational culture, and leadership. Through a review of relevant literature and case studies, students will learn how to approach complex ethical scenarios and promote a diverse, equitable, and inclusive organizational culture.
Repeat Status: Course may be repeated.
Prerequisites: SPED 408
Can be taken Concurrently: SPED 408

SPED 416 Autism Spectrum Disorders and Evidence-Based Practices 3 Credits
This course provides an overview of Autism Spectrum Disorders (ASD) and an introduction to the evidence based practices (EBPs) for practitioners, based on recently published and publicly available reports and other supporting materials. Assignments help students translate EBPs, grounded in Applied Behavior Analysis (ABA), into concrete goals and practices that have a meaningful impact on the day-to-day functioning of students with ASD.

SPED 418 Alternative Curricular Approaches 3 Credits
Curricular and instructional methods for students with pervasive support needs (e.g., intellectual disabilities, autism) who follow an alternative or modified curriculum. Methods for developing an individualized curriculum, embedding instruction and accessing the general education curriculum, systematic instruction, and instruction for full participation in school, home, and community settings are covered. Strategies for facilitating emergent social and communication skills, teaching augmentative and alternative communication, and use of assistive technologies to enhance self-directed learning are included.

SPED 419 Intensive Intervention in Reading 3 Credits
Methods course designed to address the needs of students with disabilities to increase knowledge of instruction of comprehensive pre-literacy and literacy skills and their components. Additionally, pre-reading, reading, language arts, mathematics, and content area reading literacy skills in primary and elementary settings will be addressed. Emphasis on instructional planning, differentiated instructional strategies, appropriate assessments modifications, and adaptations needed for use with individuals with disabilities through a conceptual foundation in the components of reading and the integration of research validated interventions.

SPED 420 Field Experience: Special Education Certification 1-3 Credits
Intensive practice in the application of principles of teaching for special 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 settings, and aligning instruction with standards. Consent of program director required.
Repeat Status: Course may be repeated.

SPED 421 Intensive Intervention in Mathematics and Content Area Literacy 3 Credits
Methods course designed to increase knowledge of core components of reading in secondary settings, language arts, mathematics, and content area literacy skills for students with disabilities and those who are culturally and/or linguistically diverse. Emphasis on instructional planning, differentiated instructional strategies, appropriate assessments, modifications, and adaptations needed for use with individuals with disabilities through a conceptual foundation in the components of reading and the integration of research validated interventions.

SPED 422 Theory & Philosophy in Behavior Analysis 3 Credits
This course will examine the field of human and animal learning, including operant and classical conditioning. The history and evolution of psychology and the science of behavior will be discussed. The course will provide a foundation for understanding the behaviorism of B. F. Skinner. In addition, the course will describe current applications of applied behavior analysis.
Repeat Status: Course may be repeated.

SPED 423 Supporting Transition for Individuals with Disabilities 3 Credits
Best instructional practices for preparing students for the early childhood transition into special education and the transition to post-school adult life: employment, post-secondary education, and community participation in inclusive settings. Topics include transition planning, person-centered and work-based assessments, family and interagency collaboration, innovative post-school and in-school transition services, and self-determination. Evidence-based practices to promote positive student outcomes are emphasized.

SPED 425 Applied Behavior Analysis Practicum 1-6 Credits
This practicum is designed to shape supervisee's clinical and behavioral skills as well as his/her professional, ethical, and collegial behavior. This experience embeds the concepts, principles, methods, and applications of behavior analysis learned in the course sequence and applies them to educational, clinical, and community/home settings.
Repeat Status: Course may be repeated.

SPED 427 Contemporary Service Delivery Models 3 Credits
This course is to provide students with knowledge and skills related to contemporary academic and behavioral service delivery models such as multi-tier systems of supports (MTSS). Relevant research literature will be explored to promote critical reflection on the models. Students will gain knowledge and skills in the following areas: (1) core components of service delivery models; (2) implementation of the services delivery model within k-12 schools; and (3) legal, ethical, and administrative issues related to service delivery implementation.

SPED 429 Professional Seminar 3 Credits
Master's seminar on current issues in the area of special education and research design. Must have 18 graduate credits in special education.

SPED 430 Advanced Seminar in Special Education 3 Credits
Advanced issues relating to the field of special education. Titles will vary.
Repeat Status: Course may be repeated.

SPED 432 Positive Behavior Support 3 Credits
Addresses tiered models of prevention and support. Includes design of comprehensive, multi-component behavior support plans for individuals with a variety of disabilities who engage in problem behavior. Emphasis on functional assessment and evidence-based interventions. Assessment focuses on the link between curriculum, academic performance, and behavior problems. Addresses mental health challenges, the role of various school-based professionals, and collaboration across agencies. Promotes consideration of diverse populations for understanding behavioral differences. Describes strategies for ongoing monitoring and maintenance of behavior reductions.

SPED 434 Applied Research Practicum 1-3 Credits
Designing and conducting research projects in applied settings.

SPED 440 Early Academic Intervention 3 Credits
Explores the potential effectiveness of interventions to prevent academic failure of children at risk for learning difficulties. Emphasis on research-based interventions in the areas of beginning reading, language and vocabulary, writing and spelling, awareness of print and exposure to print, and mathematics (number sense).

SPED 442 (TLT 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.

SPED 443 Special Education Student Teaching and Seminar 3-6 Credits
Intensive practice in the application of principles of teaching for special 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 settings, and aligning instruction with standards. Consent of program director required.

SPED 446 Research Methods in Behavior Analysis 3 Credits
This course focuses on research methods in behavior analysis. Students will develop operational definitions and identify data collection methods. Students will learn basic single case experimental designs and how to assess internal and external validity. Students will analyze and interpret graphic data. Students will understand treatment integrity and social validity. Students will summarize and critically evaluate single case design research studies. Finally, students will describe ethical conduct in conducting research in school, home, and community settings to improve life quality.
Repeat Status: Course may be repeated.
Prerequisites: SPED 408
Can be taken Concurrently: SPED 408

SPED 452 Assessment in Special Education 3 Credits
Identification, administration and interpretation of a variety of assessments used for planning and to determine special education eligibility and to assess social, emotional, behavioral, and academic functioning. Discusses strengths and limitations of various models and assessment, both formal and informal, instruments used to evaluate the need for special education. Describes strategies to enhance the relationship between assessment and service delivery. Addresses assessment practices to identity curricular needs consistent with the RtII framework.

SPED 454 Behavior Assessment 3 Credits
This course focuses on behavior assessment. It covers descriptive and functional assessment of problematic behavior, as well as functional analysis. Students learn to conduct record review, determine the need for behavior analytic services, select socially significant behavior-change goals, and conduct skill and preference assessment. Through case studies, students learn to describe the common functions of behavior. Examples of multi-disciplinary applications of behavior assessment are presented.
Repeat Status: Course may be repeated.
Prerequisites: SPED 408

SPED 455 Intervention and Behavior Change 3 Credits
This course teaches the application of behavior analytic principles across varied child, adult, and health contexts. Training is provided for procedures such as reinforcement, punishment, motivating operations, modeling, stimulus control, rules, shaping and chaining. Students explore methods for teaching simple to complex repertoires, using discrete trials, Skinner's analysis of verbal behavior, group contingencies, self-management, and strategies to maintain and generalize behavior. Topics include behavior change applications from a range of subject-matter experts across multiple uses of applied behavior analysis.
Repeat Status: Course may be repeated.
Prerequisites: SPED 454

SPED 465 Advanced Inclusionary Practices in K-12 3 Credits
Advanced techniques grounded in current research-based methods and best practice for educating and assessing students with disabilities, students from diverse backgrounds, and English language learners using a standards-aligned system. Accommodations, modifications, planning for physical and instructional inclusion through embedded strategic instruction, adaptations, and curriculum overlapping. Addresses decision hierarchies for level of instructional adaptation and social inclusion methods through social facilitation techniques. Explores critical factors in developing, implementing, and modifying curriculum using evidence-based practices. Explores collaborative co-planning and co-teaching models.
Prerequisites: SPED 332

SPED 482 Practicum in University Teaching: Special Education 1-4 Credits
Mentored and guided co-teaching focused on the design, organization, pedagogy and assessment of university courses in Special Education. 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.

SPED 490 Doctoral Seminar in Special Education 3 Credits
Advanced knowledge of issues and research in the education of individuals with special needs. Topics will vary. Must be admitted for doctoral studies.
Repeat Status: Course may be repeated.

SPED 499 Dissertation 1-15 Credits
Repeat Status: Course may be repeated.

Teaching Learning Technology Courses

TLT 293 Internship in Teaching, Learning, and Technology: (with subtitle) 1-6 Credits
Students engage in group design, development, and/or research projects related to teaching, learning, and/or technology. Faculty provide mentoring support.
Repeat Status: Course may be repeated.

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 471 (EVST 471) 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 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 473 (EVST 473) 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 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
Repeat Status: Course may be repeated.