

Department of Curriculum and Teaching

The Department of Curriculum and Teaching prepares teachers in content-specific, research-based pedagogy. Departmental faculty and school professionals partner to provide rich clinical experiences in diverse settings. All educator preparation programs are approved by the Alabama State Board of Education. Auburn University's College of Education is accredited through the Council for Accreditation of Educator Preparation (CAEP). Music education programs are also accredited by the National Association of Schools of Music (NASM).

Elementary education is a high demand major. Due to limited enrollment, all students who meet minimum criteria may not be admitted. See program major page in AU Bulletin (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/elementaryeducation_major/) for additional information.

In addition to undergraduate teacher education majors, the department offers undergraduate minors in community music and office systems management.

A list of [course offerings](#) is available on the Auburn University website.

Information about graduate programs is available at Curriculum and Teaching - MEd, MS, EdS, PhD, Graduate Certificate (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/curriculumandteachingmedmsedsphd_major/).

The Department of Curriculum and Teaching offers the following undergraduate majors.

Majors

- Agriscience Education (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/agriscienceeducation_major/)
- Business and Marketing Education (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/businessandmarketing_major/)
- Chemistry Education (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/chemistryeducation_major/)
- Early Childhood Education (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/earlychildhoodeducation_major/)
- Elementary Education (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/elementaryeducation_major/)
- English Language Arts Education/English (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/englishlanguageartseducation_major/)
- French Education (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/foreignlanguageeducation-french_major/)
- General Science Education (<http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/generalscienceeducation-geologyearthsystem/>)
- General Social Science Education/History (<http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/generalsocialscienceeducation-history/>)
- German Education (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/foreignlanguageeducation-german_major/)
- Mathematics Education (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/mathematicseducation_major/)
- Music Education: Instrumental and Vocal (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/musiceducation-instrumentalandvocal_major/)
- Physics Education (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/physicseducation_major/)
- Science Teaching (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/scienceteachingdouble_major/)
- Spanish Education (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/foreignlanguageeducation-spanish_major/)

Minors

- Community Music (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/communitymusic_minor/)
- Office Systems Management (http://bulletin.auburn.edu/undergraduate/collegeofeducation/curriculumandteaching/officesystemsmanagement_minor/)

Middle School Education Courses

CTMD 4190 CURRICULUM AND TEACHING IN THE MIDDLE SCHOOL (3) LEC. 2. LAB. 2. Admission to Teacher Education. To introduce and prepare undergraduate education students for the middle school student, middle school teaching, and middle level philosophy while incorporating reflective decision making.

CTMD 4900 DIRECTED STUDIES (1-6) IND. SU. Departmental approval. Independent study directed at desired objectives. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTMD 4910 PRACTICUM IN MIDDLE SCHOOL EDUCATION (1-6) PRA. SU. Departmental approval. Provides experience relating theory and practice, usually carried on simultaneously. Course may be repeated for a maximum of 6 credit hours.

CTMD 4920 CLINICAL RESIDENCY (11) AAB. 40. SU. Pr. P/C CTSE 4200 or P/C CTSE 4203. Admission to Clinical Residency. Supervised teaching in a public middle or secondary school, abroad, accompanied by scheduled discussions to analyze and evaluate the intern's experience. May count either CTMD 4920 or CTMD 4923.

CTMD 4970 SPECIAL TOPICS (1-4) LEC. Course may be repeated for a maximum of 4 credit hours.

CTMD 5010 TEACHING MATHEMATICS: MIDDLE SCHOOL (4) LEC. 2. LAB. 4. Admission to Teacher Education. The prospective middle school or junior high school mathematics teacher must examine the characteristics of students this age. Teaching strategies must be developed which lead not only to the learning of correct mathematics but also address the needs of a wide variety of learners.

CTMD 6010 TEACHING MATHEMATICS: MIDDLE SCHOOL (4) LEC. 2. LAB. 4. The prospective middle school or junior high school mathematics teacher must examine the characteristics of students this age. Teaching strategies must be developed which lead not only to the learning of correct mathematics but also address the needs of a wide variety of learners.

CTMD 7900 DIRECTED STUDIES (1-6) IND. SU. Departmental approval. Independent study directed toward desired objectives related to the respective areas of specialization. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTMD 7970 SPECIAL TOPICS (1-6) LEC. Course may be repeated for a maximum of 6 credit hours.

Career and Technical Courses

CTCT 2100 POWER EQUIPMENT TECHNOLOGY (3) LEC. 2. LAB. 3. Repair and maintenance of small air-cooled engines and power equipment in Agriculture. May count either CTCT 2100 or CTCT 3100.

CTCT 2200 COMPUTER LITERACY IN BUSINESS EDUCATION (3) LEC. 1. LAB. 4. Advanced formatting, processing, and evaluation of business correspondence, as well as administrative and employment documents. Includes basic computer literacy skills. May count either CTCT 2200 or CTCT 2203.

CTCT 3000 LEADERSHIP SKILLS FOR PERSONAL AND ORGANIZATIONAL DEVELOPMENT (3) LEC. 3. Organizational and leadership skills needed to become successful professionals in work or community activities; skills and strategies for conducting efficient meetings. Departmental approval. May count either CTCT 3000 or CTCT 3003.

CTCT 3250 INFORMATION ANALYSIS (3) LEC. 3. Decision-making and business problem solving using microcomputer software applications including spreadsheets, database management programs, and operating systems. May count either CTCT 3250 or CTCT 3253.

CTCT 4000 CLASSROOM/LABORATORY MANAGEMENT, ORGANIZATION AND EVALUATION IN CAREER AND TECHNICAL EDUCATION (2) LEC. 2. Admission to Teacher Education. Organization, objectives, principles, management, and evaluation of career and technical education classrooms, laboratories, and programs. May count either CTCT 4000 or CTCT 4003.

CTCT 4030 CAREER AND TECHNICAL STUDENT ORGANIZATIONS (3) LEC. 3. Survey of career and technical student organizations; procedures involved in developing and implementing informal and co-curricular educational programs for students and preparing students for state and national competitions.

CTCT 4140 AGRICULTURAL STRUCTURE AND METAL FABRICATION TECHNOLOGY (3) LEC. 2. LAB. 3. Materials selection and construction procedures for carpentry, concrete, masonry, electricity, plumbing, and metal fabrication.

CTCT 4160 SUPERVISED AGRICULTURAL EXPERIENCE PROGRAMS (2) LEC. 2. Responsibility for SAEP planning, supervision, and evaluation of entrepreneurship, placement, exploratory, analytical, and experimental SAEPs and record books; completing award applications.

CTCT 4900 DIRECTED STUDIES (1-6) IND. SU. Departmental approval. The student's learning efforts are guided toward desired objectives. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTCT 4910 PRACTICUM IN AREA OF SPECIALIZATION (1-6) DSL/PRA. SU. Departmental approval. Provides experience relating theory and practice, usually carried on simultaneously. Course may be repeated for a maximum of 6 credit hours.

CTCT 4920 CLINICAL RESIDENCY (12) AAB/DSL. 40. SU. Admission to Clinical Residency. Supervised clinical residency experiences abroad in a school or other appropriate setting. Evaluation and analysis of the clinical residency experience. May count either CTCT 4920 or CTCT 4923.

CTCT 4940 DIRECTED FIELD EXPERIENCE IN AREA OF SPECIALIZATION (1-3) DAG/FLD. SU. Supervised occupational work experience in an approved specialization-related occupation. Departmental approval. May count either CTCT 4940 or CTCT 4943. Course may be repeated for a maximum of 3 credit hours.

CTCT 4970 SPECIAL TOPICS IN AREA OF SPECIALIZATION (1-6) DSL. Departmental approval. Current or special topics within area of specialization. Course may be repeated for a maximum of 6 credit hours.

CTCT 5050 METHODS OF TEACHING IN AREA OF SPECIALIZATION (3) LEC. 2. LAB. 2. Admission to Teacher Education. Methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for programs within career and technical education. May count CTCT 5050, CTCT 5053, CTCT 6050, or CTCT 6056.

CTCT 5060 PROGRAM PLANNING IN AREA OF SPECIALIZATION (3) LEC. 3. Admission to Teacher Education. Introduction to principles and practices involved in designing education programs in the area of specialization. May count CTCT 5060, CTCT 5063, CTCT 6060, or CTCT 6066.

CTCT 5080 PRINCIPLES OF COORDINATION (3) LEC. 3. Admission to Teacher Education. Coordination, placement, and supervision of students in work-based programs; development of employability skills. May count CTCT 5080, CTCT 5083, CTCT 6080, or CTCT 6086.

CTCT 5200 RECORDS MANAGEMENT SYSTEMS (3) LEC. 3. Study of integrated records management systems, functions, systems, and careers; including decision making and problem solving using software applications. May count either CTCT 5200/CTCT 6200 or CTCT 6200/CTCT 6206.

CTCT 5240 MULTIMEDIA DESIGN (3) LEC. 3. Focus on presentation, desktop publishing, multimedia production, web page design, and digital graphics. May count either CTCT 5240/CTCT 5243 or CTCT 6240/CTCT 6246.

CTCT 5250 INFORMATION DESIGN & ANALYSIS (3) LEC. 3. Decision making, problem solving, and presentation using business software applications. May Count Either CTCT 3250/CTCT 3253 or CTCT 5250/CTCT 5253 CTCT 6250/CTCT 6256.

CTCT 5260 APPLIED COMPUTER TECHNOLOGY (3) LEC. 3. Capstone course with emphasis on integration of business software for decision making, processing, collaboration and management functions, including accounting and financial management. May count either CTCT 5260/CTCT 5263 or CTCT 6260/CTCT 6266.

CTCT 5940 WORK EXPERIENCE IN INFORMATION TECHNOLOGY (3) LEC. 3. SU. Supervised occupational work experience in a Commerce and Information Technology environment. May count either CTCT 4940/CTCT 4943 or CTCT 5940/CTCT 5943 or CTCT 6940/CTCT 6946.

CTCT 6050 METHODS OF TEACHING IN AREA OF SPECIALIZATION (3) LEC. 2. LAB. 2. Methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for programs within the area of specialization. Admission to alternative master's program. May count CTCT 5050, CTCT 5053, CTCT 6050, or CTCT 6056.

CTCT 6060 PROGRAM PLANNING IN AREA OF SPECIALIZATION (3) LEC. 3. Introduction to principles and practices involved in designing educational programs in the area of specialization. Admission to alternative master's program. May count CTCT 5060, CTCT 6060, or CTCT 6066.

CTCT 6080 PRINCIPLES OF COORDINATION (3) LEC. 3. Coordination, placement, and supervision of students in work-based programs; development of employability skills. May count CTCT 5080, CTCT 5083, CTCT 6080, or CTCT 6086.

CTCT 6200 RECORDS MANAGEMENT SYSTEMS (3) LEC. 3. Study of integrated records management systems, functions, and careers; including decision making and problem solving using software applications. May count either CTCT 5200/CTCT 5203 or CTCT 6200/CTCT 6206.

CTCT 6240 MULTIMEDIA DESIGN (3) LEC. 3. Focus on presentation, desktop publishing, multimedia production, web page design, and digital graphics. May count either CTCT 6240/CTCT 62406 or CTCT 5240/5243.

CTCT 6250 INFORMATION DESIGN & ANALYSIS (3) LEC. 3. Decision making, problem solving, and presentation using business software applications. May count either CTCT 6250/CTCT 6256 or CTCT 5250/5253.

CTCT 6260 APPLIED COMPUTER TECHNOLOGY (3) LEC. 3. Capstone course with emphasis on integration of business software for decision making, processing, collaboration and management functions, including accounting and financial management. May count either CTCT 5260/CTCT 5263 or CTCT 6260/6266.

CTCT 6940 WORK EXPERIENCE IN INFORMATION TECHNOLOGY (3) LEC. 3. SU. Supervised occupational work experience and software application in a Commerce and Information Technology environment. May count either CTCT 6940/CTCT 6946 or CTCT 5940/5943.

CTCT 7000 FOUNDATIONS OF CAREER AND TECHNICAL EDUCATION (3) LEC. 3. Philosophical, historical, economic, and sociological perspectives of vocational education in relation to the organization of vocational education programs. May count either CTCT 7000 or CTCT 7006.

CTCT 7010 YOUTH PROGRAM DEVELOPMENT (3) LEC. 3. Developing, managing, and evaluating formal and informal youth education programs; training volunteers for youth development programs; securing and developing supporting resources. Departmental approval. May count either CTCT 7010 or CTCT 7016.

CTCT 7100 TEACHING MECHANICAL TECHNOLOGY (3) LEC. 2. LAB. 2. Theory and practice of managing agricultural mechanics laboratories, theories of machine operation, and maintaining laboratory equipment. May count either CTCT 7100 or CTCT 7106.

CTCT 7120 COURSES OF STUDY IN AGRISCIENCE EDUCATION (3) LEC. 3. Pr. CTCT 5060 or CTCT 6060 or CTCT 5063 or CTCT 6066. Emerging technologies in agriscience education; principles and procedures of curriculum construction applied to courses of study in agriscience education. Departmental approval. May count either CTCT 7120 or CTCT 7126.

CTCT 7200 CAREER AND OCCUPATIONAL INFORMATION (3) LEC. 3. Trends and issues in occupational structure, job qualifications and requirements, and sources of occupational information for new and emerging occupations; analysis of career education models for students. Departmental approval. May count either CTCT 7200 or CTCT 7206.

CTCT 7240 ADMINISTRATIVE MANAGEMENT (3) LEC. 3. Pr. CTCT 4200 or CTCT 4203. Management of office systems, information and personnel. Managing and controlling administrative services. Departmental approval. May count either CTCT 7240 or CTCT 7246.

CTCT 7300 INTEGRATING TECHNOLOGY IN CAREER AND TECHNICAL EDUCATION (3) LEC. 3. Pr. CTCT 5050 or CTCT 6050 or CTCT 5053 or CTCT 6056. Selecting, developing, utilizing, and evaluating instructional resources and technology for teaching. Departmental approval. May count either CTCT 7300 or CTCT 7306.

CTCT 7400 AGRICULTURAL LITERACY EDUCATION (3) LEC. 3. Theories and application of agricultural literacy related scientific and technologically based concepts and processes required for personal decision making, participating in civic and cultural affairs, and economic productivity.

CTCT 7710 ADVANCED TEACHING METHODS (3) LEC. 3. Pr. (CTCT 5050 or CTCT 5053) or (CTCT 6050 or CTCT 6056). Analysis of research in theories of teaching and learning, effective teacher characteristics, learning styles, teaching methodologies, and diversity in teaching. Departmental approval. May count either CTCT 7710 or CTCT 7716.

CTCT 7720 ADVANCED PROGRAM PLANNING IN AREA OF SPECIALIZATION (3) LEC. 3. Pr. CTCT 5060 or CTCT 6060 or CTCT 5063 or CTCT 6066. Issues affecting the development and management of educational programs; strategies for improving educational programs. Departmental approval. May count either CTCT 7720 or CTCT 7726.

CTCT 7730 PROGRAM EVALUATION (3) LEC. 3. Pr. (CTCT 7720 or CTCT 7726). Principles and procedures used in evaluating academic- related programs. Alternative approaches to evaluation and practical guidelines for conducting evaluations. Departmental approval. May count either CTCT 7730 or CTCT 7736.

CTCT 7750 ADMINISTRATION OF CAREER AND TECHNICAL EDUCATION (3) LEC. 2. LAB. 2. Introduction to concepts, theories and practices related to administration, organizational behavior, and leadership in secondary and post-secondary vocational education programs. Departmental approval. May count either CTCT 7750 or CTCT 7756.

CTCT 7760 COMPREHENSIVE PLANNING IN CAREER AND TECHNICAL EDUCATION (3) LEC. 2. LAB. 2. Pr. (CTCT 7750 or CTCT 7756). Processes of comprehensive planning for vocational education programs at high school and secondary school levels using local, state, and regional data. Departmental approval. May count either CTCT 7760 or CTCT 7766.

CTCT 7770 CLINICAL SUPERVISION (3) LEC. 3. Pr. (CTCT 7710 or CTCT 7716). Theories, concepts, models, and techniques of student teacher and beginning teacher supervision by administrators, school district personnel, and university supervisors. Recommended for individuals who supervise or plan to supervise student teachers. Departmental approval. May count either CTCT 7770 or CTCT 7776.

CTCT 7780 RESEARCH IN CAREER AND TECHNICAL EDUCATION (3) LEC. 3. Review, analysis and interpretation of research procedures and data with emphasis on designing new research in vocational and adult education. Departmental approval. May count either CTCT 7780 or CTCT 7786.

CTCT 7810 SUPERVISED COLLEGE TEACHING (1) LEC. 1. SU. Departmental approval. Practical experience in the classroom under the supervision of a faculty mentor. Course may be repeated for a maximum of 2 credit hours.

CTCT 7900 DIRECTED STUDIES (1-3) DAG. SU. Departmental approval. Independent learning effort directed toward desired objectives. Includes evaluation at regular intervals by student and professor. Course may be repeated for a maximum of 3 credit hours.

CTCT 7910 PRACTICUM IN AREA OF SPECIALIZATION (1-3) DAG. SU. Departmental approval. Experiences closely relating theory and practice. Course may be repeated for a maximum of 3 credit hours.

CTCT 7920 CLINICAL RESIDENCY (9-12) AAB. 40. SU. Admission to Clinical Residency. Supervised internship experiences in a school, college or other appropriate setting. Evaluation and analysis of the internship experience. Departmental approval. May count either CTCT 7920 or CTCT 7926. Course may be repeated for a maximum of 12 credit hours.

CTCT 7950 SEMINAR IN AREA OF SPECIALIZATION (1-3) DBU/SEM. SU. Departmental approval. Presentation by graduate students of research projects and/or findings. Analysis of procedures and findings. Course may be repeated for a maximum of 3 credit hours.

CTCT 7960 SPECIAL PROBLEMS (1-3) IND. Departmental approval. Critical analysis of current and classical research and writings. Course may be repeated for a maximum of 3 credit hours.

CTCT 7970 SPECIAL TOPICS IN AREA OF SPECIALIZATION (1-6) DAG. Departmental approval. Current or advanced topics within area of specialization. Course may be repeated for a maximum of 6 credit hours.

CTCT 7990 RESEARCH AND THESIS (1-10) MST. Course may be repeated for a maximum of 10 credit hours.

CTCT 8730 CURRICULUM DEVELOPMENT IN CAREER AND TECHNICAL EDUCATION (3) LEC. 3. Pr. CTCT 7730 or CTCT 7736. Principles of career and technical education curriculum planning, identification of educational needs of students, selecting technical content, and evaluating materials. May count either CTCT 8730 or CTCT 8736.

CTCT 8770 SUPERVISION OF INSTRUCTION (3) LEC. 3. Pr. CTCT 7770 or CTCT 7776. Theories and models to become effective supervisors of vocational and adult education programs; philosophies and styles of supervision used to improve schools, instruction, curriculum and personnel. Departmental approval. May count either CTCT 8770 or CTCT 8776.

CTCT 8800 TEACHER EDUCATION (3) LEC. 3. Emphasis on beliefs, philosophy, issues, research, roles, student selection, curriculum, methodology, internships, organization, and administration of teacher education programs. Departmental approval. May count either CTCT 8800 or CTCT 8806.

CTCT 8810 SUPERVISED COLLEGE TEACHING (1-10) LEC. 3. SU. Practical experience in the classroom under the supervision of a faculty mentor. Course may be repeated for a maximum of 10 credit hours.

CTCT 8900 DIRECTED STUDIES (1-6) IND. SU. Departmental approval. Independent learning efforts at desired objectives. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTCT 8910 PRACTICUM IN AREA OF SPECIALIZATION (1-6) DSL/PRA. SU. Departmental approval. Experiences closely relating theory and practice. Course may be repeated for a maximum of 6 credit hours.

CTCT 8920 INTERNSHIP (1-10) INT. SU. Departmental approval. Supervised internship experiences in a school, college or other appropriate setting. Evaluation and analysis of the internship experience. Course may be repeated for a maximum of 10 credit hours.

CTCT 8950 SEMINAR IN AREA OF SPECIALIZATION (1-6) DSL/SEM. Departmental approval. Selected concepts and theoretical formulations of common interest. Course may be repeated for a maximum of 6 credit hours.

CTCT 8960 SPECIAL PROBLEMS (1-6) DSL/IND. Departmental approval. Critical analysis of current and classical research and writings. Course may be repeated for a maximum of 6 credit hours.

CTCT 8970 SPECIAL TOPICS IN AREA OF SPECIALIZATION (1-6) DSL. Departmental approval. Current or advanced topics within area of specialization. Course may be repeated for a maximum of 6 credit hours.

CTCT 8980 FIELD PROJECT (1-10) DAG. 1. SU. Departmental approval. Field project. Course may be repeated for a maximum of 10 credit hours.

CTCT 8990 RESEARCH AND DISSERTATION (1-10) DSL/DSR. Course may be repeated for a maximum of 20 credit hours.

Early Childhood Education Courses

CTEC 3020 PRIMARY MATH AND SCIENCE (3) LEC. 3. Exploration of learning and pedagogy for the development of math and science concepts appropriate for children in Kindergarten through Grade 3.

CTEC 3030 INTEGRATED CURRICULUM IN PRESCHOOL: EARLY LITERACY (3) LEC. 3. Coreq. CTEC 4911. This course focuses on the foundations of literacy learning including play, developmentally appropriate practices, and integration within and across disciplines through multisensory, multimodal means, connecting to the Alabama Developmental Standards. Admission to Teacher Education.

CTEC 3200 A WORKING THEORY FOR THE CONSTRUCTIVIST EDUCATOR (3) LEC. 3. Constructivist theory for pre-service teachers preparing to teach at the early childhood level.

CTEC 4200 THE CONSTRUCTIVIST TEACHER: STRATEGIES AND TECHNIQUES (3) LEC. 3. Construction of an operational knowledge of established constructive curriculum strategies and techniques.

CTEC 4210 THE CONSTRUCTIVIST TEACHER: GROWING PROFESSIONALLY (1) AAB/DSL. 1. Pr. P/C CTEC 4920 or P/C CTEC 4923. Admission to Clinical Residency. The roles and responsibilities of being an early childhood professional. May count either CTEC 4210 or CTEC 4213.

CTEC 4900 DIRECTED STUDIES (1-6) IND. SU. Departmental approval. Reading, research or other work undertaken independently by a student focused on a content area of special interest. Course may be repeated for a maximum of 6 credit hours.

CTEC 4910 PRACTICUM (1-6) PRA. SU. Departmental approval. Students and faculty cooperatively select and execute an appropriate field experience. Course may be repeated for a maximum of 6 credit hours.

CTEC 4911 PRACTICUM IN THE PRESCHOOL (1-2) LEC. 1-2. SU. Laboratory experiences with children from birth to five years of age designed to help students relate theory to practice. Course may be repeated for a maximum of 2 credit hours.

CTEC 4912 PRACTICUM IN PRIMARY GRADES (2) LEC. 2. SU. Laboratory experiences with children 5 through 9 years of age help students relate theory to practice.

CTEC 4920 CLINICAL RESIDENCY (1-12) AAB/DSL. 1-12. SU. Pr. P/C CTEC 4210 or P/C CTEC 4213. Admission to Clinical Residency. Experience in a setting serving pre-primary or primary-school children with varying abilities. Admission to internship. May count either CTEC 4920 or CTEC 4923. Course may be repeated for a maximum of 12 credit hours.

CTEC 7200 EARLY CHILDHOOD EDUCATION PERSPECTIVE (3) LEC. 3. Historical overview of current issues, trends, and programs in early childhood education. May count either CTEC 7200 or CTEC 7206.

CTEC 7210 ORIGINS OF THOUGHT (3) LEC. 3. Piaget's theories of how thought develops in young children. Comparison of the social and biological roots of thought. May not count either CTEC 7210 or CTEC 7216.

CTEC 7260 PLAY AND EARLY CHILDHOOD EDUCATION (3) LEC. 3. Examination of children's play from a constructivist theoretical perspective and translation of theory into early childhood educational practice. May count either CTEC 7260 or CTEC 7266.

CTEC 7270 THEORY-BASED PROBLEMS IN EARLY CHILDHOOD EDUCATION (3) LEC. 3. In-depth exploration of a problem related to the thought, writing and research that form the theoretical foundations of constructivist approaches in early childhood education. May count either CTEC 7270 or CTEC 7276. Course may be repeated for a maximum of 9 credit hours.

CTEC 7510 RESEARCH STUDIES IN EARLY CHILDHOOD EDUCATION (3) LEC. 3. How to read, review, analyze and interpret significant research studies in early childhood education. May count either CTEC 7510 or CTEC 7516.

CTEC 7520 CURRICULUM AND TEACHING IN EARLY CHILDHOOD EDUCATION (3) LEC. 3. Reappraisal of experiences and content for children by focusing on the nature of the learner and the nature of the knowledge to be learned. May count either CTEC 7520 or CTEC 7526.

CTEC 7530 ORGANIZATION OF PROGRAM IN EARLY CHILDHOOD EDUCATION (3) LEC. 3. Organization, administration, and supervision of early childhood programs. May count either CTEC 7530 or CTEC 7536.

CTEC 7540 EVALUATION OF PROGRAMS IN EARLY CHILDHOOD EDUCATION (3) LEC. 3. Assessment and evaluation of all program components from a constructivist perspective. May count either CTEC 7540 or CTEC 7546.

CTEC 7900 DIRECTED STUDIES (1-6) DSL/IND. SU. Departmental approval. Independent learning objectives related to the student's area of specialization. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTEC 7910 PRACTICUM IN AREA OF SPECIALIZATION (1-6) DSL/PRA. SU. Experience relating theory and practice, usually in a school setting. Departmental approval. May count either CTEC 7910 or CTEC 7916. Course may be repeated for a maximum of 6 credit hours.

CTEC 7970 SPECIAL TOPICS (3-9) AAB. Departmental approval. Cooperative pursuit of selected concepts and theories, normally in small groups. Course may be repeated for a maximum of 9 credit hours.

CTEC 7990 RESEARCH AND THESIS (1-10) DSL/MST. Course may be repeated with change in topics.

CTEC 8240 RESEARCH IN EARLY CHILDHOOD EDUCATION (3) LEC. 3. Review, analysis and interpretation of available research with emphasis on designing new research to meet the needs of young children. May count either CTEC 8240 or CTEC 8246.

CTEC 8270 THEORY-BASED PROBLEMS IN EARLY CHILDHOOD EDUCATION (3) LEC. 3. In-depth exploration of problems related to the thought, writings, and research that form the theoretical foundations of constructivist approaches to early childhood education. Master's Degree. May count either CTEC 8270 or CTEC 8276. Course may be repeated for a maximum of 6 credit hours.

CTEC 8720 DESIGNING EARLY CHILDHOOD CURRICULUM (3) LEC. 3. Application of early childhood history, philosophy, program analysis and constructivist theory to the design of early childhood curriculum. Master's Degree. May count either CTEC 8720 or CTEC 8726.

CTEC 8850 CONSTRUCTIVIST INVESTIGATIONS IN EARLY CHILDHOOD SETTINGS (3) LEC. 3. Analysis and interpretation of the design of constructivist investigation. Master's Degree.

CTEC 8950 SEMINAR (3) SEM. 3. Selected concepts and theoretical formulations of common interest. Course may be repeated for a maximum of 12 credit hours.

CTEC 8970 SPECIAL TOPICS (3-9) DSL. Departmental approval. Cooperative pursuit of selected concepts and theories, normally in small groups. Course may be repeated for a maximum of 9 credit hours.

CTEC 8980 FIELD PROJECT (1-3) DSL/FLD. SU. Students conduct research on an educational problem and defend a field project report. Departmental approval. May not count either CTEC 8980 or CTEC 8986. Course may be repeated for a maximum of 3 credit hours.

CTEC 8990 RESEARCH AND DISSERTATION (1-10) DSL/DSR. Course may be repeated with a change in topic. Course may be repeated with change in topics.

Elementary Education Courses

CTEE 2000 DIGITAL LITERACY AND COMPUTER SCIENCE IN EDUCATION (4) LEC. 3. LAB. 1. Introduction of foundational computer science concepts and practices relevant to K-6 teachers. Emphasis on the application of computational thinking skills to the development of a block-based programming as well as digital literacy skill development. Limited to majors requiring teaching certification.

CTEE 3100 INTRODUCTION TO ELEMENTARY EDUCATION (3) LEC. 3. Admission to Teacher Education. Knowledge, skills, and dispositions necessary for elementary education, with emphasis on professional expectations and school structure.

CTEE 4000 FORMATIVE ASSESSMENT IN ELEMENTARY MATHEMATICS (3) LEC. 3. Admission to Teacher Education. Coreq. CTEE 3100. Examination into mathematics learning trajectories content and ways to assess student thinking in the area of mathematics. Admission to Teacher Education required.

CTEE 4010 CURRICULUM: SOCIAL SCIENCE (4) LEC. 30. LAB. 105. Admission to Teacher Education. Pedagogical content knowledge in the major concepts and modes of inquiry for integrated study of social sciences for elementary learners.

CTEE 4020 CURRICULUM: LANGUAGE ARTS (4) LEC. 30. LAB. 105. Pr. P/C CTEE 4010. Pedagogical content knowledge in the major concepts and modes of inquiry for integrated study of language arts for elementary learners.

CTEE 4030 CURRICULUM: NATURAL SCIENCE (4) LEC. 30. LAB. 105. Pr. P/C CTEE 4040. Admission to Teacher Education. Pedagogical content knowledge, principles, and standards in the major concepts and modes of inquiry for integrated study of science for elementary learners.

CTEE 4040 CURRICULUM: MATHEMATICS (4) LEC. 30. LAB. 105. Pr. P/C CTEE 4030. Pedagogical content knowledge, principles, and standards in the major concepts and modes of inquiry for integrated study of mathematics for elementary learners.

CTEE 4190 EFFECTIVE CLASSROOM MANAGEMENT IN THE ELEMENTARY SCHOOL (3) LEC. 2. LAB. 2. Admission to Teacher Education. Through exploration, discussion, reflection, and analysis students will study issues pertaining to inclusive/ multicultural K-6 classrooms. Issues related to classroom management (e.g. behavior and time management), students with special needs, parent/ community relations, legal mandates, technology, planning, and professionalism.

CTEE 4900 DIRECTED STUDIES (1-6) IND. SU. Departmental approval. Reading, research, or other work undertaken by a student focused on a content area of special interest. The student is directed by a faculty member. Course may be repeated for a maximum of 6 credit hours.

CTEE 4910 PRACTICUM (1-6) AAB/PRA. SU. Departmental approval. Students and faculty cooperatively select an appropriate field experience. Course may be repeated for a maximum of 6 credit hours.

CTEE 4920 CLINICAL RESIDENCY (11) AAB. 11. SU. Pr. P/C CTEE 4950 or P/C CTEE 4953. Admission to Teacher Education. Supervised teaching in a public elementary school accompanied by scheduled discussions to analyze and evaluate the intern's experience. Admission to internship. May count either CTEE 4920 or CTEE 4923.

CTEE 4950 PROFESSIONAL DEVELOPMENT SEMINAR (1-4) AAB. 1. SU. Pr. P/C CTEE 4920 or P/C CTEE 4923. Admission to Teacher Education. Reflection, exploration, and study of elementary education practices in kindergarten through grade six. May count either CTEE 4950 or CTEE 4953. Course may be repeated for a maximum of 4 credit hours.

CTEE 4967 HONORS SPECIAL PROBLEMS (1-3) IND. Pr. Honors College. Departmental approval. Individual readings program. Course may be repeated for a maximum of 3 credit hours.

CTEE 4970 SPECIAL TOPICS (1-6) AAB/LEC. Departmental approval. Cooperatively selected concepts and theories pursued, normally in small groups. Course may be repeated for a maximum of 6 credit hours.

CTEE 4997 HONORS THESIS (1-3) IND. Pr. Honors College. Departmental approval. The student thesis is finalized in this course. Course may be repeated for a maximum of 3 credit hours.

CTEE 7010 APPROACHES TO TEACHING (3) LEC. 3. Organizational patterns, planning and approaches to instruction in the elementary school.

CTEE 7410 CURRICULUM AND TEACHING IN SOCIAL SCIENCE (GRADES K-6) (3) LEC. 3. Teaching practices and re-appraisal of selecting experiences and content for curriculum improvement in (K-6) social science education. May count either CTEE 7410 or CTEE 7416.

CTEE 7420 CURRICULUM AND TEACHING IN LANGUAGE ARTS (GRADES K-6) (3) LEC. 3. Teaching practices and re-appraisal of selecting experiences and content for curriculum improvement in (K-6) language arts education. May count either CTEE 7420 or CTEE 7426.

CTEE 7430 CURRICULUM AND TEACHING IN NATURAL SCIENCE (GRADES K-6) (3) LEC. 3. Teaching practices and re-appraisal of selecting experiences and content for curriculum improvement in (K-6) natural science education. May count either CTEE 7430 or CTEE 7436.

CTEE 7440 CURRICULUM AND TEACHING IN MATHEMATICS (GRADES K-6) (3) LEC. 3. Teaching practices and re-appraisal of selecting experiences and content for curriculum improvement in (K-6) mathematics education. May count either CTEE 7440 or CTEE 7446.

CTEE 7490 THE ELEMENTARY SCHOOL PROGRAM (3) LEC. 3. Major curriculum areas and teaching practices in the modern elementary school. Implications of research and theory for the total elementary school program.

CTEE 7510 RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (3) LEC. 3. Pr. CTEE 7420 or CTEE 7426. A review, analysis and interpretation of data with emphasis on designing research to meet the changing needs of the school. May count either CTEE 7510 or CTEE 7516.

CTEE 7530 ORGANIZATION OF PROGRAMS IN ELEMENTARY EDUCATION (3) LEC. 3. Organization and development of basic and supplementary materials for guiding teachers and school systems in improvement of curriculum and teaching practices. May count either CTEE 7530 or CTEE 7536.

CTEE 7540 EVALUATION OF PROGRAMS IN AREAS OF SPECIALIZATION (3) LEC. 3. Evaluation methods and exploration of evaluation literature in areas of specialization. May count either CTEE 7540 or CTEE 7546.

CTEE 7900 DIRECTED STUDIES (1-6) DSL/IND. SU. Departmental approval. Independent study related to student's respective areas of specialization. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTEE 7910 PRACTICUM IN AREA OF SPECIALIZATION (1-6) AAB. SU. Departmental approval. Provides individual students with experience relating theory and practice, usually in a school setting. Course may be repeated for a maximum of 6 credit hours.

CTEE 7970 SPECIAL TOPICS (1-6) AAB. Departmental approval. Cooperative pursuit of selected concepts and theories, normally in small groups. May count either CTEE 7970 or CTEE 7979. Course may be repeated for a maximum of 6 credit hours.

CTEE 7990 RESEARCH AND THESIS (1-10) MST. Course may be repeated for a maximum of 10 credit hours.

CTEE 8950 SEMINAR (3) SEM. 3. Selected concepts and theoretical formulations of common interest. Course may be repeated for a maximum of 12 credit hours.

CTEE 8970 SPECIAL TOPICS (1-6) LEC. Course may be repeated for a maximum of 6 credit hours.

CTEE 8980 FIELD PROJECT (1-10) DSL/FLD. SU. Students conduct research on an educational problem and defend a field project report. Departmental approval. May count either CTEE 8980 or CTEE 8986. Course may be repeated for a maximum of 10 credit hours.

CTEE 8990 RESEARCH AND DISSERTATION (1-10) DSR. Course may be repeated for a maximum of 20 credit hours.

English for Spkr Other Lang Courses

CTES 7400 TECHNOLOGY AND MEDIA IN ENGLISH FOR SPEAKERS OF OTHER LANGUAGES EDUCATION (ESOL) (3) LEC. 3. Application of instructional technology in second language instruction, authentic materials in the ESL classroom. May count either CTES 7400 or CTES 7406.

CTES 7410 CURRICULUM DEVELOPMENT IN ESOL EDUCATION (3) LEC. 3. LAB. 0, DSL/LEC. 0. This class will explore how to teach English for specific purposes by explaining how to create a curriculum in English for a particular context. The course will describe how to conduct a needs analysis and then create a curriculum based on the needs of the students.

CTES 7420 APPLIED LINGUISTICS IN SECOND LANGUAGE ACQUISITION (3) LEC. 3. Provides basic knowledge of phonetics, morphology, syntax, semantics, pragmatics, psycholinguistics, sociolinguistics and language variation to teach English language learners. May count either CTES 7420 or CTES 7426.

CTES 7430 TEACHING ESL LISTENING AND SPEAKING (3) LEC. 3. LAB. 0, DSL/LEC. 0. This course will prepare ESL/EFL teachers to develop engaging and effective listening and speaking lessons in a variety of contexts. Students will design and implement effective listening and speaking lessons for a variety of proficiency levels.

CTES 7440 TEACHING ESL READING AND WRITING (3) LEC. 3. LAB. 0, DSL/LEC. 0. This course will increase understanding of the theory and practices of reading and writing skills that actively engage English learners.

CTES 7460 TEACHING ENGLISH TO SPEAKERS OF OTHER LANGUAGES IN P-12 (3) LEC. 3. Teaching practices and curriculum selection in P-12 ESOL. May count either CTES 7460 or CTES 7466.

CTES 7470 ISSUES IN ENGLISH FOR SPEAKERS OF OTHER LANGUAGES EDUCATION (ESOL) (3) LEC. 3. Examination of central issues in the teaching and learning of ESOL including language policy, language diversity and multiculturalism. May count either CTES 7470 or CTES 7476.

CTES 7480 ASSESSMENT IN ENGLISH FOR SPEAKERS OF OTHER LANGUAGES (ESOL) (3) LEC. 3. Theoretical perspectives on assessment of English Language Learners. Developing, administering and analyzing assessment instruments. May count either CTES 7480 or CTES 7486.

CTES 7490 METHODS IN ESL GRAMMAR (3) LEC. 3. LAB. 0, DSL/LEC. 0. This course will explore the English language beyond the prescriptive rules commonly taught and to develop an in-depth understanding of the challenges English language learners have with grammar. It will explore ways grammar impacts writing and speaking, best practices for grammar instruction, and considerations in error correction. Key grammar lessons will be developed and practiced.

CTES 7920 CLINICAL RESIDENCY (1-9) AAB. SU. Supervised teaching in a K-12 public school accompanied by scheduled discussions to analyze and evaluate the intern's experience. Course may be repeated for a maximum of 9 credit hours.

Music Education Courses

CTMU 1010 INTRODUCTION TO MUSIC EDUCATION (0) LAB. 1. Introduction to teaching music.

CTMU 1020 MUSIC EDUCATION LAB I (1) LAB. 3. Development and documentation of general music instructional abilities and dispositions for school and community music educators. Clear background check required.

CTMU 2010 MUSIC EDUCATION LAB II (1) LAB. 3. Development and documentation of vocal or instrumental music instructional abilities and dispositions for school and community music educators. Clear background check required.

CTMU 3040 MUSIC AND RELATED ARTS (4) LEC. 2. LAB. 4. Interdisciplinary instruction appropriate for students' developmental characteristics which synthesize the content, professional resources, curriculum goals and instructional strategies of music.

CTMU 4900 DIRECTED STUDIES (1-6) IND. SU. Departmental approval. Independent reading, research or other work focused on a content area of special interest. The student is directed by a faculty member. Course may be repeated for a maximum of 6 credit hours.

CTMU 4910 PRACTICUM IN AREA OF SPECIALIZATION (1-6) DSL/PRA. Admission to Teacher Education. Cooperatively selected field experience. May count either CTMU 4910 or CTMU 4913. Course may be repeated for a maximum of 6 credit hours.

CTMU 4920 CLINICAL RESIDENCY (12) AAB/DSL. 40. SU. Admission to Clinical Residency. Supervised on-the-job experience in a school or other appropriate setting abroad with regularly scheduled discussions with supervising faculty provide evaluation and analysis of the intern. May count either CTMU 4920 or CTMU 4923.

CTMU 4967 HONORS SPECIAL PROBLEMS (1-3) IND. Pr. Honors College. Departmental approval. Individual readings program. Course may be repeated for a maximum of 3 credit hours.

CTMU 4970 SPECIAL TOPICS IN AREA OF SPECIALIZATION (1-6) LEC. Departmental approval. Cooperatively selected concepts and theories pursued, normally in small groups. Course may be repeated for a maximum of 6 credit hours.

CTMU 4997 HONORS THESIS (1-3) IND. Pr. Honors College. The student's thesis is finalized in this course. Course may be repeated for a maximum of 3 credit hours.

CTMU 5110 CHILDREN'S MUSIC LEARNING (4) LEC. 3. LAB. 3. Musical development and learning, birth-childhood. Curriculum, methods, and assessment for community and school children's music. Clear background check required. May count either CTMU 5110 or CTMU 6110.

CTMU 5120 SCHOOL AND COMMUNITY GENERAL MUSIC EDUCATION (4) LEC. 3. LAB. 3. Musical development and learning, adolescence-adulthood. Curriculum, methods, and assessment for community and school general music. Clear background check required. May count either CTMU 5120 or CTMU 6120.

CTMU 5130 SCHOOL AND COMMUNITY INSTRUMENTAL MUSIC EDUCATION (4) LEC. 3. LAB. 3. Musical development and learning, instrumentalists. Curriculum, methods, and assessment for community and school instrumental music. Clear background check required. May count either CTMU 5130 or CTMU 6130.

CTMU 5140 SCHOOL AND COMMUNITY VOCAL MUSIC EDUCATION (4) LEC. 3. LAB. 3. Admission to Teacher Education. Musical development and learning of vocalists. Curriculum, methods, and assessment for community and school vocal music. Clear background check required. May count either CTMU 5140 or CTMU 6140.

CTMU 6110 CHILDREN'S MUSIC LEARNING (4) LEC. 3. LAB. 3. Musical development and learning, birth-childhood. Curriculum, methods, and assessment for community and school children's music. Clear background check required. May count either CTMU 5110, CTMU 6110 or CTMU 6116.

CTMU 6120 SCHOOL AND COMMUNITY GENERAL MUSIC EDUCATION (4) LEC. 3. LAB. 3. Musical development and learning, adolescence-adulthood. Curriculum, methods, and assessment for community and school general music. Clear background check required. May count either CTMU 5120 or CTMU 6120/CTMU 6126.

CTMU 6130 SCHOOL AND COMMUNITY INSTRUMENTAL MUSIC EDUCATION (4) LEC. 3. LAB. 3. Musical development and learning, instrumentalists. Curriculum, methods, and assessment for community and school instrumental music. Clear background check required. May count either CTMU 5130, CTMU 6130 or CTMU 6136.

CTMU 6140 SCHOOL AND COMMUNITY VOCAL MUSIC EDUCATION (4) LEC. 3. LAB. 3. Musical development and learning of vocalists. Curriculum, methods, and assessment for community and school vocal music. Clear background check required. May count either CTMU 5140, CTMU 6140 or CTMU 6146.

CTMU 6940 ELEMENTARY/MIDDLE SCHOOL MUSIC METHODS (3) LEC. 3. Methodology, materials, organization and activities for elementary and middle school music programs. Includes professional field experiences in public school music programs. Admission to Alternative Master's Certification Program.

CTMU 6960 SECONDARY MUSIC METHODS (3) LEC. 3. Methodology, materials, organization and activities for secondary music programs. Includes professional field experiences in public school music programs. Admission to Alternative Master's Certification Program

CTMU 7000 SCHOOL AND COMMUNITY MUSIC (1) LEC. 1. Developing skills, disposition, community, and research planning for graduate students in school and community music. May count either CTMU 7000 or CTMU 7006. Course may be repeated for a maximum of 2 credit hours.

CTMU 7510 RESEARCH STUDIES IN MUSIC EDUCATION (3) RES. 3. Review, analysis and interpretation of available research with emphasis on designing new research to meet the changing needs of school musicians. May count either CTMU 7510 or CTMU 7516.

CTMU 7520 CURRICULUM AND TEACHING IN MUSIC EDUCATION (3) LEC. 3. Teaching practices and evaluation of experiences and content for curriculum improvements. Students develop recommendations for music curriculum. May count either CTMU 7520 or CTMU 7526.

CTMU 7530 ORGANIZATION OF PROGRAM IN MUSIC EDUCATION (3) LEC. 3. Program, organization and development of basic and supplementary materials for guiding teachers, facilities and school systems in continuous improvement of curriculum and teaching practices in music education. May count either CTMU 7530 or CTMU 7536.

CTMU 7540 EVALUATION OF PROGRAM IN MUSIC EDUCATION (3) LEC. 3. Evaluation and investigation of teaching effectiveness including the utilization of human and material resources and the coordination of areas of specialization and issues in evaluation which are unique to music education settings. May count either CTMU 7540 or CTMU 7546.

CTMU 7550 APPLICATIONS OF TECHNOLOGY IN MUSIC EDUCATION (3) LEC. 3. An overview of applications of current technology in music classroom, studios, and offices. May count either CTMU 7550 or CTMU 7556.

CTMU 7560 DIGITAL MEDIA PRODUCTION FOR MUSIC EDUCATION (3) LEC. 3. Current tools, skills, and concepts for creating aural and visual interactive applications. May count either CTMU 7560 or CTMU 7566.

CTMU 7570 MUSIC INSTRUCTION MULTIMEDIA RESEARCH AND DEVELOPMENT (3) LEC. 3. Pr. CTMU 7550 or CTMU 7556. Departmental approval. Current research music instructional technology, design of interactive applications.

CTMU 7580 PSYCHOLOGY OF MUSIC (3) LEC. 3. This course will focus on exploring the musical experience psychological, psycho-acoustic, emotional, anthropological, sociological, and assistance perspectives to better understand how philosophical and practical approaches work in music teaching, learning, and in community settings. May count either CTMU 7580 or CTMU 7586.

CTMU 7590 WEB DESIGN AND MEDIA FOR MUSIC EDUCATORS (3) LEC. 3. Exploration and creation of media for music-focused curriculum and curriculum support focused on competent implementation and delivery via web sites and web-based platforms.

CTMU 7900 DIRECTED STUDIES (1-6) IND. SU. Departmental approval. Independent study directed toward desired objectives related to student's respective areas of specialization. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTMU 7910 PRACTICUM IN AREA OF SPECIALIZATION (1-6) DMU/PRA. SU. Departmental approval. Experience relating theory and practice, usually in a school setting. Course may be repeated for a maximum of 6 credit hours.

CTMU 7970 SPECIAL TOPICS (1-9) DMU. Departmental approval. Provides an opportunity for graduate students and professors to pursue cooperatively selected topics. Course may be repeated for a maximum of 9 credit hours.

CTMU 7990 RESEARCH AND THESIS (1-10) MST. Course may be repeated with change in topics.

CTMU 8950 SEMINAR (1-3) DMU. Selected concepts and theoretical formulations of common interest. Course may be repeated for a maximum of 12 credit hours.

CTMU 8980 FIELD PROJECT (1-6) DMU. SU. Course may be repeated for a maximum of 6 credit hours.

CTMU 8990 RESEARCH AND DISSERTATION (1-10) DSL/DSR. Course may be repeated with change in topics.

Reading Education Courses

CTRD 3000 FOUNDATIONS OF LANGUAGE AND LITERACY INSTRUCTION I (3) LEC. 2. LAB. 1. Admission to Teacher Education. Research-based theory and teaching strategies to meet the language and literacy needs of all children, especially those at risk of reading difficulties. Includes laboratory teaching experience. May count either CTRD 3000 or CTRD 3710.

CTRD 3010 FOUNDATIONS OF LANGUAGE AND LITERACY INSTRUCTION II (4) LEC. 3. LAB. 3. Admission to Teacher Education. Theoretical foundations of language and literacy development of children and implications for teaching. Clinical, laboratory experiences with children. May count either CTRD 3010, CTRD 3003, or CTRD 3700.

CTRD 4900 DIRECTED STUDIES (1-6) IND. SU. Departmental approval. Independent reading, research, or other work focused on a content area of special interest. The student is directed by a faculty member. Course may be repeated for a maximum of 6 credit hours.

CTRD 5000 LANGUAGE AND LITERACY IN THE CONTENT AREAS (3) LEC. 3. LAB. 0. Strategies to help fluent readers and English language learners learn content in the disciplines by strategic reading of texts. May count either CTRD 5000, CTRD 5003, CTRD 6000, or CTRD 6006.

CTRD 5030 THE READING OF ADOLESCENTS (3) LEC. 3. Admission to Teacher Education. Reading patterns of adolescents and uses of young adult literature in reading and English language arts programs, grades 6-12.

CTRD 5700 DEVELOPMENTAL READING K-12 (3) LEC. 3. Admission to Teacher Education. Theoretical and research foundations for a balanced approach to reading assessment and instruction, K-12. May count CTRD 5700, CTRD 6700, or CTRD 6706.

CTRD 6000 LANGUAGE AND LITERACY IN THE CONTENT AREAS (3) LEC. 3. Strategies to help fluent readers and English language learners learn content in the disciplines by strategic reading of texts. May count either CTRD 5000, CTRD 5003, CTRD 6000, or CTRD 6006.

CTRD 6030 THE READING OF ADOLESCENTS (3) LEC. 3. Reading patterns of adolescents and uses of young adult literature in reading and English language arts programs, grades 6-12.

CTRD 6700 DEVELOPMENTAL READING K-12 (3) LEC. 3. Theoretical and research foundations for a balanced approach to reading assessment and instruction, K-12. May count CTRD 5700, CTRD 6700, or CTRD 6706.

CTRD 6710 LITERACY AND INQUIRY IN THE CONTENT AREAS: GRADES 6-12 (3) LEC. 3. Strategies to enhance literacy and inquiry for students' content-area learning in the middle and secondary school. May count CTRD 5710, CTRD 6710, or CTRD 6716.

CTRD 7400 ASSESSMENT AND INSTRUCTION FOR READING INTERVENTION (3) LEC. 3. Research-based analysis of causal factors in reading difficulties, assessment strategies, and effective teaching with delayed readers. Includes practicum.

CTRD 7510 RESEARCH STUDIES IN READING EDUCATION (3) DSL/RES. 3. Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.

CTRD 7520 CURRICULUM AND TEACHING IN READING EDUCATION (3) LEC. 3. Teaching practices and reappraisal of selected experiences and content for curriculum improvement.

CTRD 7530 ORGANIZATION OF PROGRAM IN READING EDUCATION (3) LEC. 3. Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.

CTRD 7540 EVALUATION OF PROGRAM IN READING EDUCATION (3) LEC. 3. Evaluation and investigation of teaching effectiveness with attention to the utilization of human and material resources and the coordination of areas of specialization.

CTRD 7900 DIRECTED STUDIES (1-6) DSL/IND. SU. Departmental approval. Independent study directed toward desired objectives related to respective areas of specialization. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTRD 7910 PRACTICUM IN AREA OF SPECIALIZATION (1-6) DSL/PRA. SU. Departmental approval. Experience relating theory and practice, usually in a school setting. Course may be repeated for a maximum of 6 credit hours.

CTRD 7920 CLINICAL RESIDENCY (1-9) DRD. SU. Supervised on-the-job experiences in a school, college or other appropriate setting, accompanied by regularly scheduled, on-campus discussion periods. Departmental approval. May count either CTRD 7920 or CTRD 7926. Course may be repeated for a maximum of 9 credit hours.

CTRD 7970 SPECIAL TOPICS (1-6) LEC. Departmental approval. Provides an opportunity for graduate students and professors to pursue cooperatively selected topics. Course may be repeated for a maximum of 6 credit hours.

CTRD 7990 RESEARCH AND THESIS (1-10) MST. Course may be repeated with change in topic.

CTRD 8950 SEMINAR (3) SEM. 3. Selected concepts and theoretical formulations of common interest. Course may be repeated for a maximum of 12 credit hours.

CTRD 8980 FIELD PROJECT (1-10) FLD. SU. Course may be repeated for a maximum of 10 credit hours.

CTRD 8990 RESEARCH AND DISSERTATION (1-10) DSL/DSR. Course may be repeated with change in topics.

Secondary Education Courses

CTSE 1000 INQUIRY APPROACHES TO SCIENCE TEACHING: STEP 1 (1) LEC. 1. LAB. 2. This course allows students to explore teaching as a career. Following an introduction to the theory and practice behind excellent inquiry-based science instruction, candidates teach lessons in elementary classrooms to obtain firsthand experience in planning and implementation. An elementary school placement is chosen to help the AUTEACH student connect with youth who are moving into the targeted grade band. Master teachers in AUTEACH are instructors and are chosen for their experience and success in secondary classrooms. They provide candidates direct exposure to people who love teaching and view it as a rewarding career choice. Mentor teachers at the schools where candidates teach their prepared lessons demonstrate effective teaching techniques and classroom management skills, giving the future teachers a true taste of working in a supportive, diverse educational setting. The course emphasizes using the 5E Learning Cycle instructional model.

CTSE 2000 INQUIRY APPROACHES TO SCIENCE TEACHING: STEP 2 (1) LEC. 1. LAB. 2. This course allows students to continue developing the lesson planning and teaching skills explored in CTSE 1000 (Step 1). After observing a lesson being taught in a local school district classroom, students (in pairs) plan and teach two inquiry-based lessons to sixth, seventh, or eighth graders. Middle school science classrooms are selected both for the diversity of the student body and the quality of the classroom teachers, who serve as mentors for the Step 2 students assigned to them. For their final product, Step 2 students analyze and modify one of the lessons they taught, taking into account the results of the assessments, their reflection on how successful the lesson was, and feedback from observers (Mentor Teacher, Instructor, or Teaching Assistant). By the end of Step 2, students are usually able to make a decision about whether to pursue teacher certification through the AUTEach program. In addition to the unique Core Components and Course Objectives listed below, all AUTEach courses are designed in accordance with the AUTEach Course Design Principles. The course emphasizes using the 5E Learning Cycle instructional model.

CTSE 2500 INQUIRY APPROACHES TO SCIENCE TEACHING: COMBINED STEP 1 AND 2 (2) LEC. 2. LAB. 4. This course allows students to explore teaching as a career, learn the theory and practice behind excellent inquiry-based science instruction, and teach lessons in elementary and middle school classrooms in order to plan and implement lessons. This course replaces CTSE 1000 and CTSE 2000. It's a combined course. After observing lessons being taught in local school districts, students work in pairs to plan and teach two lessons in elementary classrooms, and two inquiry-based lessons to sixth, seventh, or eighth graders. Elementary and middle school science classrooms are selected both for the diversity of the student body and the quality of the classroom teachers, who serve as mentors for the students assigned to them. For their final product, Step 1/2 students analyze and modify one of the lessons they taught, taking into account the results of the assessments, their reflection on how successful the lesson was, and feedback from observers (Mentor Teacher, Instructor, or Teaching Assistant). By the end of this class, students are usually able to make a decision about whether to pursue teacher certification through the AUTEach program.

CTSE 4050 CURRICULUM AND TEACHING I: SOCIAL SCIENCE (4) LEC. 2. LAB. 4. Pr. CTSE 4210. Admission to Teacher Education. Application of current educational research and instructional strategies to the design of meaningful social studies instruction and assessment.

CTSE 4060 CURRICULUM AND TEACHING II: SOCIAL SCIENCE (4) LEC. 2. LAB. 4. Pr. CTSE 4050 and CTSE 4210. Admission to Teacher Education. Curriculum decision making and planning for instruction, evaluation, and classroom management.

CTSE 4070 CURRICULUM AND TEACHING I: FOREIGN LANGUAGE (4) LEC. 2. LAB. 4. Admission to Teacher Education. Strategies for teaching foreign language students with a special emphasis on developing good instruction for comprehensible input and emerging speech tasks. May count either CTSE 4070 or CTSE 4073.

CTSE 4080 CURRICULUM AND TEACHING II: FOREIGN LANGUAGE (4) LEC. 2. LAB. 4. Pr. CTSE 4070 or CTSE 4073. Admission to Teacher Education. Teaching strategies based on language acquisition theories that are appropriate for teaching foreign language students. May count either CTSE 4080 or CTSE 4083.

CTSE 4090 CURRICULUM AND TEACHING I: SCIENCE (4) LEC. 2. LAB. 4. Admission to Teacher Education. Planning, teaching strategies, evaluation techniques and classroom management procedures needed to be a successful science teacher.

CTSE 4150 CURRICULUM AND TEACHING I: ENGLISH LANGUAGE ARTS (4) LEC. 2. LAB. 4. Pr. CTSE 5010 and CTSE 5020. Admission to Teacher Education. Teaching the expressive English language arts, writing and speaking, in middle and high school classrooms.

CTSE 4160 CURRICULUM AND TEACHING II: ENGLISH LANGUAGE ARTS (4) LEC. 2. LAB. 4. Pr. CTSE 4150. Admission to Teacher Education. Teaching the receptive English language arts; reading, listening, and viewing; in middle and high school classrooms. Admission to Teacher Education required.

CTSE 4210 SOCIAL SCIENCE CONCEPTS AND METHODS (3) LEC. 3. For pre-service teachers. Organizing social science disciplinary knowledge into an integrated framework that is meaningful, useful, and relevant to high school students. 15 hours in social sciences (2000 level or above).

CTSE 4900 DIRECTED STUDIES (1-6) DSL/IND. SU. Departmental approval. Independent reading, research, or other work focused on a content area of special interest. The student is directed by a faculty member. Course may be repeated for a maximum of 6 credit hours.

CTSE 4910 PRACTICUM (1-6) DSL/PRA. SU. Departmental approval. Admission to Teacher Education. Cooperatively selected field experience. Course may be repeated for a maximum of 6 credit hours.

CTSE 4920 CLINICAL RESIDENCY (11) AAB/DSL. 40. SU. Pr. P/C CTSE 5210 or P/C CTSE 5213 or P/C CTSE 5220 or P/C CTSE 5223 or P/C CTSE 5230 or P/C CTSE 5233 or P/C CTSE 5240 or P/C CTSE 5243 or P/C CTSE 5250 or P/C CTSE 5253 or P/C CTSE 5410. Admission to Clinical Residency. Supervised teaching in a public secondary school abroad accompanied by scheduled discussions to analyze and evaluate the intern's experience. May count either CTSE 4920 or CTSE 4923.

CTSE 4930 AUTEACH CLINICAL RESIDENCY (8) DSL/FLD. 30. SU. Pr. P/C CTSE 5240 or P/C CTSE 5243. Departmental approval. Supervised science teaching in a public secondary school accompanied by scheduled discussions to analyze and evaluate the clinical resident's experience.

CTSE 4970 SPECIAL TOPICS (1-4) DSL. Departmental approval. Cooperatively selected concepts and theories pursued, normally in small groups. Course may be repeated for a maximum of 4 credit hours.

CTSE 5000 TECHNOLOGY IN SCIENCE EDUCATION (2) LEC. 2. Introduction and application of current and emerging instructional and communication technologies for integration in the secondary science program. May count either CTSE 5000, CTSE 5003, CTSE 6000 or CTSE 6006.

CTSE 5010 LANGUAGE STUDY FOR TEACHERS (3) LEC. 3. Theories of language development and language study applicable to middle and high school classrooms; implications for teaching grammar, usage, dialects, and semantics. Departmental approval. Junior standing. May count either CTSE 5010, CTSE 6010 or CTSE 6016.

CTSE 5020 RHETORIC AND COMPOSITION FOR TEACHERS (3) LEC. 3. Theories of rhetoric and composition applicable to middle and high school classrooms; implications for planning writing curricula, instruction, and assessment/evaluation. May count either CTSE 5020 or CTSE 6020.

CTSE 5030 TEACHING MATHEMATICS: HIGH SCHOOL (4) LEC. 2. LAB. 4. Strategies for teaching and evaluating high school mathematics to promote the learning of all students.

CTSE 5040 TECHNOLOGY AND APPLICATIONS IN SECONDARY MATHEMATICS EDUCATION (4) LEC. 2. LAB. 4. Pr. MATH 2660. Use of technological tools to enhance mathematics teaching and learning. May count either CTSE 5040 or CTSE 6040.

CTSE 5050 ANALYZING PERSISTENT ISSUES IN HISTORY AND GEOGRAPHY (3) LEC. 3. This course will engage students in inquiry-based and Persistent Issues in History units of content instruction with selected topics that integrate history and geography content and then deconstruct those units to examine the research-based learning and assessment principles that underlie their design.

CTSE 5060 ANALYZING PERSISTENT ISSUES IN POLITICAL ECONOMY (3) LEC. 3. This course integrates moral philosophy, political science, and economics into an exploration of persistent issues in political economy. Students will metacognitively analyze their own learning as they investigate and propose a policy solution to a political economy problem.

CTSE 5090 CURRICULUM AND TEACHING I: SCIENCE (4) LEC. 2. LAB. 4. Planning, teaching strategies, evaluation techniques and classroom management procedures needed to be a successful science teacher.

CTSE 5100 CURRICULUM AND TEACHING II: SCIENCE (4) LEC. 2. LAB. 4. Pr. CTSE 4090. Admission to Teacher Education. Higher-order reasoning and process skills using state and national standards as guides. Theoretical and applied approaches. May count either CTSE 5100 or CTSE 6100.

CTSE 5110 PERSPECTIVES IN SCIENCE (3) LEC. 3. Perspectives on Science is an overview and introduction to the scholarly field of science history with applications for embedding historical stories and discoveries into today's secondary science classrooms.

CTSE 5210 TEACHER INQUIRY WORKSHOP: PROBLEMS AND POSSIBILITIES (1) LEC. 1. Pr. P/C CTSE 4920 or P/C CTSE 4923. Admission to Clinical Residency. Community of practice for English Language Arts clinical residents to support professional practice through teacher inquiry. May count either CTSE 5210, CTSE 5213, CTSE 6210, or CTSE 6216.

CTSE 5220 CLASS MANAGEMENT AND DISCIPLINE IN FOREIGN LANGUAGE CLASSROOM (1-2) AAB. Admission to Clinical Residency. Seminar for clinical residents on classroom management in Foreign Language Education. May count either CTSE 5220 or CTSE 6220. Course may be repeated for a maximum of 2 credit hours.

CTSE 5230 MANAGING MIDDLE AND HIGH SCHOOL CLASSROOM (MATH EDUCATION) (1) AAB/DSL. 15. Pr. P/C CTSE 4920 or P/C CTSE 4923. Admission to Clinical Residency. The role of the teacher in mathematics classroom management. Methods for developing a positive learning environment. May count either CTSE 5230, CTSE 5233, CTSE 6230 or CTSE 6236.

CTSE 5240 CLINICAL RESIDENCY SEMINAR IN SCIENCE TEACHING (1) AAB/DSL. 15. Pr. P/C CTSE 4920 or P/C CTSE 4923. Admission to Clinical Residency. Seminar for Science Education clinical residents in classroom management, professional development, diversity and equity issues, theory and practice. May count either CTSE 5240, CTSE 5243, CTSE 6240 or CTSE 6246.

CTSE 5250 SEMINAR IN SOCIAL SCIENCE EDUCATION (1) AAB/DSL. 15. Pr. P/C CTSE 4920 or P/C CTSE 4923. Admission to Clinical Residency. Best practices for managing secondary social science classrooms and ethically resolving students discipline issues for a positive learning climate for all students. May count either CTSE 5250, CTSE 5253, CTSE 6250 or CTSE 6256.

CTSE 6000 TECHNOLOGY IN SCIENCE EDUCATION (2) LEC. 2. Introduction and application of current and emerging instructional and communication technologies for integration in the secondary science program. May count either CTSE 5000, CTSE 5003, CTSE 6000 or CTSE 6006.

CTSE 6010 LANGUAGE STUDY FOR TEACHERS (3) LEC. 3. Theories of language development and language study applicable to middle and high school classrooms; implications for teaching grammar, usage, dialects, and semantics. Departmental approval. May count either CTSE 5010, CTSE 6010 or CTSE 6016.

CTSE 6020 RHETORIC AND COMPOSITION FOR TEACHERS (3) LEC. 3. Theories of rhetoric and composition applicable to middle and high school classrooms; implications for planning writing curricula, instruction, and assessment/evaluation. May count either CTSE 5020, CTSE 6020 or CTSE 6026.

CTSE 6030 TEACHING MATHEMATICS: HIGH SCHOOL (4) LEC. 2. LAB. 4. Strategies for teaching and evaluating high school mathematics to promote the learning of all students.

CTSE 6040 TECHNOLOGY AND APPLICATIONS IN SECONDARY MATHEMATICS EDUCATION (4) LEC. 2. LAB. 4. Use of technological tools to enhance mathematics teaching and learning. May count either CTSE 5040 or CTSE 6040.

CTSE 6050 ANALYZING PERSISTENT ISSUES IN HISTORY AND GEOGRAPHY (3) LEC. 3. This course will engage students in inquiry-based and Persistent Issues of History units of content instruction with selected topics that integrate history and geography content and then deconstruct those units to examine the research-based learning and assessment principles that underlie their design.

CTSE 6060 ANALYZING PERSISTENT ISSUES IN POLITICAL ECONOMY (3) LEC. 3. This course integrates moral philosophy, political science, and economics into an exploration of persistent issues in political economy. Students will metacognitively analyze their own learning as they investigate and propose a policy solution to a political economy problem.

CTSE 6090 CURRICULUM AND TEACHING I: SCIENCE (4) LEC. 2. LAB. 4. Planning, teaching strategies, evaluation techniques and classroom management procedures needed to be a successful science teacher.

CTSE 6100 CURRICULUM AND TEACHING II: SCIENCE (4) LEC/LLB. 6. Pr. CTSE 4090. Higher-order reasoning and process skills using state and national standards as guides. Theoretical and applied approaches. May count either CTSE 5100 or CTSE 6100.

CTSE 6210 TEACHER INQUIRY WORKSHOP: PROBLEMS AND POSSIBILITIES (1) AAB. 1. Pr. P/C CTSE 7920 or P/C CTSE 7926. Admission to Clinical Residency. Community of practice for English Language Arts clinical residents to support professional practice through teacher inquiry. May count either CTSE 5210, CTSE 5213, CTSE 6210, or CTSE 6216.

CTSE 6220 CLASS MANAGEMENT AND DISCIPLINE IN FOREIGN LANGUAGE CLASSROOM (1) AAB. 15. Pr. P/C CTSE 7920 or P/C CTSE 7926. Admission to Clinical Residency. Seminar for clinical residents on classroom management in Foreign Language Education. May count either CTSE 5220, CTSE 5223, CTSE 6220 or CTSE 6226.

CTSE 6230 MANAGING MIDDLE AND HIGH SCHOOL CLASSROOM (MATH EDUCATION) (1) AAB. 15. Pr. (P/C CTSE 7920 or P/C CTSE 7926). Admission to Clinical Residency. The role of the teacher in mathematics classroom management. Methods for developing a positive learning environment. May count either CTSE 5230, CTSE 5233, CTSE 6230 or CTSE 6236.

CTSE 6240 CLINICAL RESIDENCY SEMINAR IN SCIENCE TEACHING (1) AAB. 15. Pr. P/C CTSE 7920 or P/C CTSE 7926. Admission to Clinical Residency. Seminar for Science Education clinical residents in classroom management, professional development, diversity and equity issues, theory and practice. May count either CTSE 5240, CTSE 5243, CTSE 6240 or CTSE 6246.

CTSE 6250 SEMINAR IN SOCIAL SCIENCE EDUCATION (1) AAB. 15. Pr. P/C CTSE 7920 or P/C CTSE 7926. Admission to Clinical Residency. Best practices for managing secondary social science classrooms and ethically resolving students discipline issues for a positive learning climate for all students. May count either CTSE 5250, CTSE 5253, CTSE 6250 or CTSE 6256.

CTSE 6710 LANGUAGE STUDY FOR TEACHERS (3) LEC. 3. Theories of language development and language study applicable to middle and high school classrooms; implications for teaching grammar, usage, dialects, and semantics. May count either CTSE 5710, CTSE 6710, or CTSE 6716.

CTSE 7000 ORIENTATION TO TEACHING AND LEARNING (1) LEC. 1. Skills, dispositions, community, and research planning for graduate students including preparation of a research proposal. May count either CTSE 7000 or CTSE 7006.

CTSE 7490 THE SECONDARY SCHOOL PROGRAM (3) LEC. 3. Departmental approval. Implications of research and theory for the total secondary school program.

CTSE 7510 RESEARCH STUDIES IN AREA OF SPECIALIZATION (3) LEC. 3. Research methodology, landmark studies, critique and application of research in the area of specialization.

CTSE 7520 CURRICULUM AND TEACHING IN AREA OF SPECIALIZATION (3) LEC. 3. Nature of learners and of knowledge and implications for building curricula and planning instruction in the area of specialization. May count either CTSE 7520 or CTSE 7526.

CTSE 7530 ORGANIZATION OF PROGRAM IN AREA OF SPECIALIZATION (3) LEC. 3. Program models, components, and standards in the area of specialization. May count either CTSE 7530 or CTSE 7536.

CTSE 7540 EVALUATION OF PROGRAM IN AREA OF SPECIALIZATION (3) LEC. 3. Theoretical perspectives of evaluation and methods of evaluating learners, teachers, and curricula. May count either CTSE 7540 or CTSE 7546.

CTSE 7560 EQUITY ISSUES IN MATHEMATICS EDUCATION (3) LEC. 3. Theories, issues, and pedagogy related to achieving equity in mathematics education.

CTSE 7800 CAPSTONE IN TEACHING AND LEARNING (2) LEC. 2. Development of a unique portfolio based on professional interest and demonstration the ability to foster student achievement through the design, implementation, and assessment of learning activities. May count either CTSE 7800 or CTSE 7806.

CTSE 7900 DIRECTED STUDIES (1-6) DSL/IND. SU. Departmental approval. Independent study directed toward desired objectives related to their respective areas of specialization. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTSE 7910 PRACTICUM IN AREA OF SPECIALIZATION (1-6) AAB. SU. Departmental approval. Experience relating theory and practice, usually in a school setting. Course may be repeated for a maximum of 6 credit hours.

CTSE 7920 CLINICAL RESIDENCY (8-11) AAB. 40. SU. Pr. P/C CTSE 6210 or P/C CTSE 6216 or P/C CTSE 6220 or P/C CTSE 6226 or P/C CTSE 6230 or P/C CTSE 6236 or P/C CTSE 6240 or P/C CTSE 6246 or P/C CTSE 6250 or P/C CTSE 6256. Admission to Clinical Residency. Supervised clinical residency experiences in a school, college or other appropriate setting. Evaluation and analysis of the clinical residency experience. Departmental approval. May count either CTSE 7920 or CTSE 7926. Course may be repeated for a maximum of 11 credit hours.

CTSE 7970 SPECIAL TOPICS (1-6) DFL. Departmental approval. Provides an opportunity for the graduate student and professor to pursue selected topics in depth. Course may be repeated for a maximum of 6 credit hours.

CTSE 7990 RESEARCH AND THESIS (1-10) MST. Course may be repeated with change in topics.

CTSE 8950 SEMINAR (1-3) DSL/SEM. Selected concepts and theoretical formulations of common interest. Course may be repeated for a maximum of 12 credit hours.

CTSE 8980 FIELD PROJECT (1-3) DSL/FLD. SU. Departmental approval. Students review literature pertaining to a problem they have identified in their own practice, form hypotheses, plan intervention, collect data, analyze and interpret results, write summary of the project following approved guidelines, and orally defend the results of their project. Course may be repeated for a maximum of 3 credit hours.

CTSE 8990 RESEARCH AND DISSERTATION (1-10) DSL/DSR. Course may be repeated with change in topics.