

**Descriptions — Surgery  
of  
Courses**

**616. Thoracic Surgery Clerkship**  
Fall, Spring, Summer. 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course.  
P: SUR 608. R: Open only to graduate-professional students in College of Human Medicine.  
Problem solving in thoracic medicine and surgery. Pulmonary physiology. Diagnostic tools and tests, and indications for surgical procedures.

**618. Anesthesia Clerkship**  
Fall, Spring, Summer. 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course.  
P: SUR 608. R: Open only to graduate-professional students in College of Human Medicine.  
Common anesthetic agents. Performing anesthetic procedures under faculty supervision.

**619. Sub-specialty Surgery Clerkship**  
Fall, Spring, Summer. 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course.  
P: SUR 608. R: Open only to graduate-professional students in College of Human Medicine.  
Surgical domains not covered otherwise or in which students desire further exposure.

**620. Advanced Surgery Clerkship**  
Fall, Spring, Summer. 6 credits.  
P: SUR 608, MED 608. R: Open only to graduate-professional students in College of Human Medicine.  
Advanced experience in critical care, trauma, and nutrition. Students must successfully complete several technical bedside procedures with more responsibility for patient care than in SUR 608.

**621. Surgical Nutritional Care Clerkship**  
Fall, Spring, Summer. 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course.  
P: SUR 608. R: Open only to graduate-professional students in College of Human Medicine.  
Clinical experience with nutrition team dealing with surgical and medical patients requiring therapeutic nutrition as a result of metabolic derangement and nutritional deficiencies.

**637. Core Competencies III**  
Spring, Summer. 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Human Medicine, Medicine, Pediatrics and Human Development, Family Practice, and Obstetrics, Gynecology and Reproductive Biology. Administered by Human Medicine  
P: FMP 602. R: Open only to graduate-professional students in College of Human Medicine.  
A weekly seminar addressing core knowledge and skills from an interdisciplinary perspective.

**801. Shock and Metabolism**  
Fall. 4(4-0)  
R: Open only to M.S. students in Surgery.  
Results of prolonged reduction in tissue perfusion on tissue metabolism, structure, and function at the systemic, cellular and subcellular levels. Pharmacologic interventions useful in volume resuscitation.

**802. Clinical Surgical Anatomy**  
Spring. 4(2-4) Interdepartmental with Anatomy.  
R: Open only to Master's students in Surgery.  
Review of surgical anatomy. Detailed anatomical information through lecture and dissection sessions. Clinical interpretation of anatomy and surgical approaches.

**803. Enteral and Parenteral Nutrition**  
Fall, Summer. 3(3-0)  
R: Open only to M.S. students in Surgery.  
Identification of individuals requiring nutritional support. Nutritional requirements in diseases. Delivery of total parenteral and enteral nutrition. Special problems.

**804. Research Design and Quantitative Techniques for Surgical Residents**  
Spring. 3(3-0)  
R: Open only to students in master's degree program in Surgery.  
Recognition and differentiation between experimental designs. Identification of strengths and weaknesses of a manuscript. Recognition and definition of statistical terms and common inferential techniques used in surgical research. Use of computer software in research.

**890. Seminars in Research**  
Fall, Spring, Summer. 1 credit. A student may earn a maximum of 5 credits in all enrollments for this course.  
R: Open only to M.S. students in Surgery.  
Philosophy and methods of research. Preparation and presentation of research data in research reports. Practical applications.

**899. Master's Thesis Research**  
Fall, Spring, Summer. 3 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course.  
P: SUR 801, SUR 802, SUR 803, SUR 804. R: Open only to M.S. students in Surgery. Approval of department.

**SYSTEMS SCIENCE SYS**

**Department of Electrical Engineering  
College of Engineering**

**410. Systems Methodology**  
Spring. 2(1-3)  
P: CE 370. R: Open only to Engineering Arts seniors. Completion of Tier I writing requirement.  
Systems analysis and design. Needs analysis, system identification, graphical models. Team project required.

**TEACHER EDUCATION TE**

**Department of Teacher Education  
College of Education**

**150. Reflections on Learning**  
Fall, Spring, Summer. 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education.  
Students' experiences as learners in comparison to psychological, sociological, and anthropological theories and assumptions about learning and teaching in and out of school.

**240. Diverse Learners in Multicultural Perspective**  
Fall, Spring, Summer. 3(2-2) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.  
R: Not open to students with credit in TE 250.  
Communicative, linguistic, physical, sensory, behavioral, affective, and cognitive differences in learning in multicultural classrooms. Factors that mediate access to knowledge.

**250. Human Diversity, Power, and Opportunity in Social Institutions**  
Fall, Spring, Summer. 3(3-0)  
Comparative study of schools and other social institutions. Social construction and maintenance of diversity and inequality. Political, social and economic consequences for individuals and groups.

**301. Learners and Learning in Context (W)**  
Spring. 4(3-4)  
P: TE 150; TE 250 or CEP 240. R: Not open to freshmen and sophomores. Open only to Education majors and to students in Education specialization. Completion of Tier I writing requirement.  
Role of social context and sociocultural background in learning. Natural and socially constructed differences among learners. Relationship among subject-specific knowledge, teaching and learning that subject, and the institutional and communal context. Multiple literacies.

**401. Teaching of Subject Matter to Diverse Learners (W)**  
Fall. 5(3-8)  
P: TE 301. R: Not open to freshmen and sophomores. Open only to Education majors and to students in Education specialization. Completion of Tier I writing requirement.  
Examining teaching as enabling diverse learners to inquire into and construct subject-specific meanings. Adapting subject matter to learner diversity. Exploring multiple ways diverse learners make sense of the curriculum.

**402. Crafting Teaching Practice (W)**  
Spring. 6(4-8)  
P: TE 401. R: Not open to freshmen and sophomores. Open only to Education majors and to students in Education specialization. Completion of Tier I writing requirement.  
Gathering data on learners to inform content and instructional decisions. Deciding what should be taught for specific disciplines. Teachers' multiple roles and their professional, intellectual, sociopolitical, and communal responsibilities.

**405. Feminist Analyses of Education in the United States**  
Fall. 3(3-0) Interdepartmental with Women's Studies. Administered by Women's Studies.  
P: WS 201; WS 202 or WS 203. R: Not open to freshmen and sophomores.  
Feminist perspectives on the role of gender in structuring educational experiences in elementary and secondary school.

**470. Student Teaching**  
Fall, Spring. 1 to 10 credits. A student may earn a maximum of 10 credits in all enrollments for this course.  
R: Not open to freshmen and sophomores. Open only to teacher certification candidates.  
Extended supervised experience in K-12 classrooms to develop proficiency in teaching. Learning to teach and nature of teaching practice.  
Temporary approval effective from Summer Semester 1994 through Spring Semester 1996.

**473. Elementary Student Teaching: Special Education**  
Fall, Spring. 10(2-24)  
R: Not open to freshmen and sophomores. Open only to elementary special education teaching certification candidates.  
Supervised special education student teaching in elementary schools. Participation in planning, implementing and evaluating instruction. Individualized Educational Planning (IEP) Committees and multidisciplinary exercises.  
Temporary approval effective from Summer Semester 1994 through Spring Semester 1996.

- 474. Secondary Student Teaching: Special Education**  
Fall, Spring, 10(2-24)  
R: Not open to freshmen and sophomores. Open only to secondary special education teaching certification candidates.  
Supervised special education student teaching in secondary school settings. Full-time practicum experience includes planning, implementing and evaluating instruction. Participation in IEP Committees and multidisciplinary exercises.  
Temporary approval effective from Summer Semester 1994 through Spring Semester 1996.
- 490. Independent Study in Teacher Education**  
Fall, Spring, Summer, 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course.  
R: Not open to freshmen and sophomores. Open only to students with a teacher certification option. Approval of department.  
Supervised individual or small group study of the practice of teaching.
- 494. Field Experience in Teacher Education**  
Fall, Spring, 1 to 10 credits. A student may earn a maximum of 10 credits in all enrollments for this course.  
R: Approval of Department  
Supervised practica and/or observations in educational settings.
- 495. Directed Teaching**  
Fall, Spring, 9 credits. Interdepartmental with Music. Administered by Music.  
P: MUS 260, MUS 335, MUS 336, MUS 339, TE 250; MUS 457, MUS 458 or MUS 467, MUS 468. R: Open only to seniors in Instrumental Music Education, Stringed Instrument Music Education, and Vocal-General Music Education.  
Supervised Music teaching experience in Schools, on-campus seminar required.
- 501. Internship in Teaching Diverse Learners I**  
Fall, 6(2-24)  
P: TE 402. C: TE 801, TE 802. R: Open only to students seeking teacher certification.  
Directed and evaluated internship in heterogeneous classrooms. Teaching worthwhile content to students with varied learning needs. Theoretical and field-based explorations of common teaching dilemmas.
- 502. Internship in Teaching Diverse Learners II**  
Spring, 6(2-24)  
P: TE 501. C: TE 803, TE 804. R: Open only to students seeking teacher certification.  
Continuing internship in heterogeneous classrooms at selected schools. Increased emphasis on independent teaching. Maintaining classroom communities that ensure equitable access to important knowledge and skills. Assessing academic and social outcomes.
- 801. Professional Roles and Teaching Practice I**  
Fall, 3(2-3)  
P: TE 402. C: TE 501, TE 802. R: Open only to students seeking teacher certification.  
Teachers' professional and ethical responsibilities. Connections of schools to other social agencies. Relations of teachers to colleagues, families, other social service providers, and community leaders. Roles in school governance.
- 802. Reflection and Inquiry in Teaching Practice I**  
Fall, 3(2-3)  
P: TE 402. C: TE 501, TE 801. R: Open only to students seeking teacher certification.  
Qualitative and quantitative research methods on teaching and learning. Criteria for judging the validity and applicability of research-based knowledge. Framing educational problems worthy of inquiry. Designing and assessing studies of teaching practice.
- 803. Professional Roles and Teaching Practice II**  
Spring, 3(2-3)  
P: TE 801. C: TE 502, TE 804. R: Open only to students seeking teacher certification.  
School-agency alliances for fostering student learning. Strategies for working with families and community groups to improve responsiveness of the school curriculum to student needs. Child advocacy in the school and community.
- 804. Reflection and Inquiry in Teaching Practice II**  
Spring, 3(2-3)  
P: TE 802. C: TE 502, TE 803. R: Open only to students seeking teacher certification.  
Collecting, analyzing, and interpreting data on teaching, learning, and educational policy. Dilemmas surrounding research on practice. Appraising and reporting results of inquiry.
- 805. Learning Mathematics**  
Fall, 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.  
Learning and development of mathematical thinking and knowledge in educational settings from perspectives of psychology, anthropology, mathematics, and other disciplines. Implications for teaching.
- 807. Professional Development and Inquiry**  
Fall, Summer, 2(2-0)  
R: Open only to masters students in Curriculum and Teaching.  
Teacher-centered inquiry through autobiography and documentation of self as learner. Relationship of personal research to classroom-based research. Application to practice.
- 808. Inquiry into Classroom Teaching and Learning**  
Fall, Summer, 2(2-0)  
R: Open only to masters students in Curriculum and Teaching.  
Alternative forms of classroom inquiry to improve teaching and learning of subject matter. Social context of teaching and learning, pedagogy, and teaching effects. Social and academic outcomes for diverse learners.
- 809. Curriculum, Staff Development, and School Change**  
Fall, Summer, 2(2-0)  
R: Open only to masters students in Curriculum and Teaching.  
Inquiry into problems and promise of school change through curriculum and staff development.
- 810. History of American Education**  
Spring of odd-numbered years, 3(3-0)  
Social and intellectual history of educational ideals and institutions. Legacies of reform initiatives. Evolution of the education profession.
- 811. Philosophical Inquiry and Contemporary Issues in Education**  
Fall, Spring, 3(3-0)  
Philosophies of education. Analytic tools used for evaluating current educational goals, practices, issues, and reforms.
- 812. Sociological Inquiry into Education**  
Spring of even-numbered years, 3(3-0)  
Relationships of educational organizations and practices to social structures and institutions.
- 813. Education, Development and Social Change**  
Spring of odd-numbered years, 3(3-0) Interdepartmental with Educational Administration. Administered by Educational Administration.  
Rise of modern systems of education in developed and developing countries. Education, the state, and national development. Colonial heritage, linkages, and globalization of educational development.
- 815. Comparative Analysis of Educational Practice**  
Fall of even-numbered years, 3(3-0)  
Cross-national comparison of educational practices in light of differences in culture, social organization, economic conditions, and historical circumstance. International perspectives on education in the United States. Borrowing and adapting educational practices.
- 816. Education in Transition**  
Fall of odd-numbered years, 3(3-0)  
Comparative analysis of change in educational concepts, policies, and practice.
- 817. Alternative Perspectives on Human Abilities**  
Spring, 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.  
Various perspectives on the nature of human abilities. Implications for educating diverse students. Social constructivist perspectives on the historical and cultural roots of traditional views of intelligence.
- 818. Curriculum In Its Social Context**  
Fall, Spring, 3(3-0)  
Philosophical, social, and historical foundations of curriculum. Issues and practices across subjects, grades, and school settings. Moral consequences of curriculum decisions for teachers and students.
- 820. Power and Pluralism in School Practice**  
Spring of odd-numbered years, 3(3-0)  
Connections between schools and diversity, inequality, and power in society. Genesis and consequences of school policies for diverse learners.
- 821. Race and Educational Policy in the United States**  
Spring of even-numbered years, 3(3-0)  
Educational policy in relation to race in the United States. Efforts to promote equity through racially sensitive curricular and instructional practices.
- 822. Issues of Culture in Classroom and Curriculum**  
Fall of odd-numbered years, 3(3-0)  
Socio-cultural contexts and functions of schooling. Cultural diversity in education. Schools and classrooms as cultural systems. Students' cultural backgrounds in relation to curriculum. Developing effective multicultural curricula for all students.
- 823. Learning Communities and Equity**  
Spring, 3(3-0)  
Cooperative grouping and heterogeneous learning teams. Impact of learning communities on equity and on school curricula.

**Descriptions — Teacher Education  
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Courses**

- 824. Classroom Assessment**  
*Fall, Spring. 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.*  
*R: Open only to graduate students in College of Education.*  
Basic assessment for classroom teachers. Design, development, and use of objective test and other methods of assessing and grading student progress, including portfolios and performance assessments.
- 825. Diverse Learners and Learning Subject Matter**  
*Summer. 3(3-0)*  
Multiple perspectives on teaching subject matter to diverse learners. Texts, curricula, and pedagogical approaches. Subject-specific issues related to classroom diversity.
- 826. Evaluation of Educational Programs and Policies**  
*Spring. 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.*  
*P: CEP 822.*  
Qualitative and quantitative methods to assess the effectiveness of public policies and resulting educational programs. Theory and practice of program evaluation.
- 830. Designing Interdisciplinary Curricula**  
*Spring of even-numbered years. 3(3-0)*  
Historical and conceptual analyses of ways to design, organize, and integrate curricula across subject areas. Evaluation and application of criteria for planning and teaching interdisciplinary curricula.
- 831. Teaching School Subject Matter with Technology**  
*Fall, Spring. 3(3-0)*  
Uses of technologies in teaching subject matter to diverse learners. Critical perspectives on technologies in schools.
- 840. Proseminar I: Historical Bases of Literacy Instruction**  
*Fall. 3(3-0)*  
*R: Open only to graduate students in Literacy Instruction.*  
Relationships between language processes and schooling.
- 841. Proseminar II: Psychological Bases of Literacy Instruction**  
*Spring. 3(3-0)*  
*P: TE 840. R: Open only to graduate students in Literacy Instruction.*  
Psychological foundations of literacy instruction, including theories and models of reading and writing. Psychological processes, social and contextual factors, and text features relevant to literacy instruction.
- 842. Advanced Methods of Elementary School Reading**  
*Fall, Summer. 3(3-0)*  
Methods and materials for teaching developmental and content area reading in grades K-8.
- 843. Reading, Writing, and Reasoning in Secondary School Subjects**  
*Spring. 3(3-0)*  
Knowledge and methodology for teaching language, literacy, and thinking in selected secondary school subjects.
- 844. Classroom Literacy Assessment**  
*Summer. 3(3-0)*  
Knowledge and methodology about ongoing and summative types of classroom assessment in oral language, reading, and writing at the elementary and secondary levels.
- 845. Language Diversity and Literacy Instruction**  
*Fall. 3(3-0)*  
*P: One introductory linguistics course.*  
Acquisition of literacy in schools by language minority students and other learners with diverse backgrounds.
- 846. Seminar in Literacy Instruction**  
*Spring. 3(3-0)*  
*P: CEP 819, TE 840. R: Open only to master's students in Literacy Instruction. Approval of department.*  
Synthesis and application of knowledge acquired through consideration of current research and issues from practice.
- 847. Methods for Teaching Language Arts**  
*Fall. 3(3-0)*  
Methods and materials for teaching listening, speaking, reading, and writing with emphasis on language development across the curriculum.
- 848. Methods of Writing Instruction**  
*Spring of even-numbered years. 3(3-0)*  
*P: TE 847.*  
Rationale and methods for writing instruction from pre-writing through drafting and editing.
- 849. Methods and Materials for Teaching Children's and Adolescent Literature**  
*Fall of odd-numbered years, Summer of even-numbered years. 3(3-0)*  
Evaluation and utilization of various genres and elements of literature with focus on literature for students in grades K-12.
- 850. Critical Reading for Children and Adolescents**  
*Fall of even-numbered years. 3(3-0)*  
*P: TE 849.*  
Teaching and learning of critical and aesthetic responses to literature for K-12 students.
- 851. Literacy for the Young Child in Home and School**  
*Spring of odd-numbered years. 3(3-0)*  
*P: TE 849.*  
Literacy development in children from early infancy through age six, with emphasis on evaluation and utilization of writings for young children.
- 855. Teaching School Mathematics**  
*Fall. 3(3-0)*  
*P: Two undergraduate mathematics courses.*  
Methods, materials, activities, and content important to teaching mathematics. Emphasis on conceptual understanding of mathematical ideas. Implications for lesson development, teaching diverse learners, and evaluating student learning.
- 856. Alternatives in School Mathematics Curriculum**  
*Spring, Summer. 3(3-0)*  
*P: Two undergraduate mathematics courses.*  
Selection and appraisal of mathematics curricula. Uses of materials in the classroom. Representation of selected mathematical content for diverse learners.
- 857. Teaching and Learning Mathematical Problem Solving**  
*Spring. 3(3-0)*  
*P: Two undergraduate mathematics courses.*  
Alternative approaches to solving mathematical problems and incorporating problem solving into K-12 teaching. Selection, appraisal, and uses of problems in the classroom. Materials and assessment strategies.
- 860. Practice and Inquiry in Science Education**  
*Spring. 3(3-0)*  
Teaching science subjects. Emphasis on learner diversity, learning community, conceptual understanding, subject matter content, and learners' prior knowledge.
- 865. Teaching and Learning K-12 Social Studies**  
*Fall. 3(3-0)*  
Purposes for teaching and learning social studies. Developing citizenship, social science reasoning, and content knowledge with diverse learners.
- 866. K-12 Social Studies Curriculum**  
*Spring of odd-numbered years. 3(3-0)*  
Issues and practices in social studies from historical, philosophical, and epistemological perspectives. Student diversity and the social studies curriculum. Reforms and needed research in social studies education.
- 867. Perspectives in Social Studies: Global Education**  
*Fall of odd-numbered years, Summer. 3(3-0)*  
Issues affecting the global community. Educational strategies for developing a global perspective on human relationships and the environment.
- 868. Perspectives in Social Studies: Law-Related Education**  
*Summer. 3(3-0)*  
Intellectual, social, and personal premises for law-related education. Strategies for curricular infusion.
- 869. Perspectives in Social Studies: Teaching about Canada**  
*Summer of even-numbered years. 3(3-0)*  
Teaching about Canada and Canadian-American relations. Social, cultural, political, and environmental issues.
- 870. Curriculum Design, Development, and Deliberation in Schools**  
*Spring. 3(3-0)*  
Simulation in group curriculum deliberation. Critique of curriculum discourse, process, and product. Teachers' roles in site-based curriculum and staff development.
- 872. Teachers as Teacher Educators**  
*Spring. 3(3-0)*  
Experienced teachers' contributions to the professional development of novice teachers. Implications for school change.
- 875. Teaching in International Schools**  
*Summer of even-numbered years. 3(3-0)*  
Issues of teaching in schools with multinational student populations. Relationship of curricular and school organizational structures to local culture.
- 882. Seminars in Curriculum and Teaching (MTC)**  
*Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.*  
Intensive study of selected topics in curriculum and teaching.

**883. Seminars in Literacy Instruction (MTC)**  
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.  
Intensive study of selected topics in literacy instruction.

**890. Independent Study**  
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 9 credits in all enrollments for this course.  
Supervised individual study in an area of curriculum, teaching, or schooling.

**891. Special Topics in Teaching, Curriculum, and Schooling**  
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.

**891A. Special Topics in Science Education**  
Summer. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.

**894. Laboratory and Field Experiences in Curriculum, Teaching, and Schooling**  
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 9 credits in all enrollments for this course.  
Supervised graduate practica, observations, and internships in fields of emphasis in curriculum, teaching, and schooling.

**899. Master's Thesis Research**  
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.

**901. Proseminar in Curriculum, Teaching and Educational Policy I**  
Fall. 3(3-0)  
R: Open only to doctoral students in Curriculum, Teaching, and Educational Policy.  
Two historical episodes related to improving teaching practice, teacher and student learning, curricula, and educational policy. Nature and effects of educational reforms.

**902. Proseminar in Curriculum, Teaching, and Educational Policy II**  
Spring. 3(3-0)  
P: TE 901. R: Open only to doctoral students in Curriculum, Teaching, and Educational Policy.  
Two historical episodes related to improving teaching practice, teacher and student learning, curricula, and educational policy. Nature and effects of educational reforms.

**907. Psychological Study of Teaching**  
Fall of odd-numbered years. 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.  
R: Open only to Ph.D. students in Education.  
Research literature on psychological aspects of teachers and teaching. Topics include teacher's decision-making, learning from experience and developmental changes.

**912. Psychology and Pedagogy of Literacy**  
Fall of even-numbered years. 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.  
R: Open only to doctoral students in College of Education, College of Arts and Letters, and College of Social Science.  
Psychological, historical, and methodological foundations of research and practice in literacy instruction.

**913. Psychology and Pedagogy of Mathematics**  
Fall of odd-numbered years. 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.  
P: CEP 902. R: Open only to Ph.D. students in College of Education.  
Psychological theory and research on the learning of mathematics. Development of mathematical thinking and knowledge in school and other settings.

**914. Psychology and Pedagogy of Science**  
Spring of odd-numbered years. 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.  
P: CEP 902. R: Open only to Ph.D. students in College of Education.  
Psychological and epistemological aspects of learning and teaching science.

**915. Language, Literacy and Learning**  
Spring of even-numbered years. 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.  
R: Open only to Ph.D. students in Education.  
Role of language in mediating cognition, affect, and action in educational contexts. Relationship between oral and written discourse and sociocultural contexts.

**916. History of Curriculum and School Subjects**  
Spring of even-numbered years. 3(3-0)  
Formation and organization of contemporary U.S. school curricula and school subjects in historical, epistemological, and sociopolitical contexts.

**917. Contemporary Theories and Discourses in Education**  
Fall of even-numbered years. 3(3-0)  
Logical positivism, interpretive theories, critical theory, feminist theory, poststructuralism and neo-pragmatism. Applications to curriculum, teaching, and educational policy.

**918. Disciplinary Knowledge and School Subjects**  
Spring. 3(3-0)  
Cross-disciplinary comparisons of the nature of knowledge, its creation, refutation, and use. Correspondence between disciplinary knowledge and knowledge as represented in schools.

**919. Policy Analysis in Education**  
Fall. 3(3-0)  
Conception, generation, and analysis of educational policies. Contexts such as governance levels, national setting, and legislative forms. Uses, limitations, and ethics of policy analysis.

**920. Social Analysis of Educational Policy**  
Spring. 3(3-0)  
Social science perspectives on factors outside and inside school systems which shape policy and influence both the nature of policy problems and the form of educational solutions.

**921. Learning to Teach**  
Fall. 3(3-0)  
Intellectual, practical, and moral dimensions of teaching and learning to teach. Impact of formal and informal influences on teachers' knowledge, skills, and attitudes.

**922. Contexts and Micropolitics of Teacher Education**  
Fall of odd-numbered years. 3(3-0)  
Historical and contemporary forms of teacher education in relation to social and institutional contexts. Relation of traditional and innovative programs to basic tensions and issues in the field.

**923. Comparative Perspectives on Teaching, Curriculum, and Teacher Education**  
Spring of odd-numbered years. 3(3-0)  
Contrasting national responses to universal questions. Links among education and other nation-building institutions. Organization and distribution of knowledge. Organization of, preparation for, and practice of teaching.

**924. Philosophy of Education: Ideas and Methods**  
Spring of even-numbered years. 3(3-0)  
Selected ideas in education from different philosophical traditions. Issues of method, historical perspectives, and textual analysis.

**930. Educational Inquiry**  
Fall, Spring. 4(4-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.  
R: Not open to students with credit in CEP 822.  
Alternative approaches to educational research: quantitative, interpretive, and customized. Theoretical assumptions, sources of questions, data collection and analysis, and rhetoric.

**931. Qualitative Methods in Educational Research**  
Fall. 4(4-0) Interdepartmental with Educational Administration, and Counseling, Educational Psychology and Special Education.  
P: CEP 930. R: Open only to doctoral students. Approval of department.  
Multiple traditions of qualitative research in education. Approaches to theory, research questions and design, data collection and analysis, and reporting. Ethical issues. Appraising qualitative research.

**933. Quantitative Methods in Educational Research**  
Fall, Spring. 4(4-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.  
P: CEP 822 or CEP 930. One introductory research design or statistics course. R: Open only to graduate students in College of Education, College of Agriculture and Natural Resources, or College of Human Ecology.  
Techniques of data analysis and statistical inference used in educational and psychological research. Multiple regression, analysis of variance, and basic principles of experimental design in educational applications.

**940. Curriculum Deliberation and Development**  
Fall of odd-numbered years. 3(3-0)  
Research in curriculum deliberation and development. Discourse, group dynamics, processes, and outcomes for teaching and learning.

**941. Marginalized Subjects in Curriculum and Teaching**  
Spring of odd-numbered years. 3(3-0)  
School subjects, ways of knowing, and people marginalized by omission or inequitable policies and practices in schools. Critical and feminist pedagogy.

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**942. Economic Analysts in Educational Policy Making**  
Spring of even-numbered years. 3(3-0) Interdepartmental with Educational Administration. Administered by Educational Administration. Economic effects of education. Economic analysis of policy issues in education. Alternative theoretical perspectives. Applications to the United States and other countries.

**946. Current Issues in Literacy Research and Instruction**  
Spring of odd-numbered years. 3(3-0)  
Current research trends in the psychological, social, and political dimensions of literacy and literacy instruction.

**950. Mathematical Ways of Knowing**  
Fall of even-numbered years. 3(3-0)  
P: Two undergraduate mathematics courses. Philosophical, cultural, political, societal, psychological, and historical perspectives on knowing in mathematics as a discipline.

**955. Contemporary Issues in Science Curriculum and Teaching**  
Fall. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Epistemological, social, psychological, and historical foundations of science education in relation to contemporary issues and problems of science curriculum, teaching, and policy.

**960. Language, Literacy, and Educational Policy**  
Fall of odd-numbered years. 3(3-0)  
Policy in relation to framing curriculum. The linguistic nature of pupil assessment. Gatekeeping functions of schools.

**965. The Craft of Policy Analysis in Education**  
Spring of odd-numbered years. 3(3-0)  
Framing problems, devising alternative solutions, and predicting impacts.

**970. Curriculum and Pedagogy in Teacher Education**  
Spring of even-numbered years. 3(3-0)  
Teacher learning opportunities at the preservice, induction, and inservice levels. Intended and enacted curriculum, sources of pedagogy, and their impact on teachers' knowledge, skills, and attitudes.

**971. Teacher Learning in School Settings**  
Fall of odd-numbered years. 3(3-0)  
Research about school-based learning by prospective, beginning, and experienced teachers. Observation, conversation, writing, and classroom research as tools for improving teaching.

**975. Policy Perspectives on Teaching and Teacher Education**  
Fall of odd-numbered years. 3(3-0)  
Policy issues such as teacher accountability, teacher knowledge, and political influence.

**982. Seminar in Curriculum, Teaching, and Educational Policy (MTC)**  
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course. Intensive study in an area of curriculum, teaching, and learning; educational policy and social analysis; or teacher education and teacher learning.

**990. Independent Study**  
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course.  
R: Open only to doctoral students.  
Supervised individual study in an area of curriculum, teaching, and educational policy.

**991. Special Topics in Curriculum, Teaching, and Educational Policy**  
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 9 credits in all enrollments for this course.

**991A. Special Topics in Science Education**  
Spring of odd-numbered years. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

**994. Laboratory and Field Experience in Curriculum, Teaching, and Educational Policy**  
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course.  
R: Open only to doctoral students. Approval of department.

Supervised practica, observations, and internships in an area of curriculum, teaching and learning; educational policy and social analysis; or teacher education and teacher learning.

**995. Research Practicum in Curriculum, Teaching, and Educational Policy**  
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course.  
R: Open only to doctoral students. Approval of department.

Supervised research practicum. Design, execution, analysis, presentation, critique, and revision of research projects.

**999. Doctoral Dissertation**  
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 36 credits in all enrollments for this course.  
R: Open only to Ph.D. students.

**TELECOMMUNICATION TC**  
**Department of Telecommunication  
College of Communication Arts  
and Sciences**

**100. The Information Society**  
Fall, Spring, Summer. 3(3-0)  
Technological and social trends in the information society. Social policy involving information technologies and information services. Examples from the telephone, computer, television, cable, radio and satellite systems.

**200. History and Economics of Telecommunication**  
Fall, Spring, Summer. 4(4-0)  
P: EC 201 or concurrently. R: Not open to freshmen. Institutional, economic and content development of telecommunication including broadcasting, cable, new video technologies, and telephone and data transmission.

**201. Introduction to Telecommunication Technology**  
Fall, Spring, Summer. 4(4-0)  
P: MTH 110 or MTH 116; CPS 100 or CPS 130 or CPS 131 or concurrently. R: Not open to freshmen. Operational principles of audio, data and video telecommunication technologies.

**240. Telecommunication Media Arts**  
Fall, Spring, Summer. 4(2-4)  
R: Not open to freshmen.  
Characteristics of image and sound media and their role in shaping the meaning of media messages. Application of aesthetic principles in the design of mediated communication.

**275. Effects of Mass Communication**  
Fall, Spring, Summer. 3(3-0) Interdepartmental with Communication.  
R: Not open to freshmen.  
Major social effects of mass media on audience behavior. Political communication. Media effects on children. Message strategies producing attitude change. Interrelationships between mass media and interpersonal communication.

**310. Basic Telecommunication Policy**  
Fall, Spring, Summer. 4(4-0)  
P: TC 100, TC 200, TC 201, TC 240.  
Policy and plans in telecommunication systems and services in the United States and other nations.

**342. Basic Video Design and Production**  
Fall, Spring, Summer. 4(2-4)  
P: TC 240. R: Open only to Telecommunication majors. Approval of department; application required. Conceptualization, design, planning, producing, directing, editing, and evaluation of video programs.

**343. Basic Audio Production**  
Fall, Spring, Summer. 4(2-4)  
P: TC 201, TC 240. R: Open only to Telecommunication majors. Approval of department; application required. Basic audio production techniques. In-depth audio and radio industry analysis. Media writing.

**345. Media Arts Content and Culture**  
Spring. 3(3-0)  
R: Not open to freshmen and sophomores.  
Media content as cultural discourse. Cultural themes in content and structure of media entertainment, news, sports, religious and political programs and commercials.

**352. Broadcast and Cable Programming and Audience Promotion**  
Fall, Spring, Summer. 3(3-0)  
P: TC 200, TC 240, or approval of department. R: Not open to freshmen.  
Evaluation, selection and scheduling of cable and broadcast programming. Audience promotion strategies and techniques.

**354. Telecommunication Marketing and Sales Promotion**  
Fall, Spring. 3(3-0)  
P: TC 200, ML 300.  
Application of advertising and marketing concepts to broadcast stations, cable systems, program networks and telecommunications.

**361. Telecommunication System and Service Policies**  
Spring. 3(3-0)  
P: TC 200, TC 201, TC 310; ACC 230.  
Services, systems, and public policy related to telephone and telecommunication.

**370. History of Film and Documentary**  
Fall, Spring. 4(2-4)  
R: Not open to freshmen.  
Analysis of fiction and non-fiction forms, emphasizing social background and cultural values. Screening of significant feature and documentary films.