Descriptions — Surgery of Courses

804. Research Design and Quantitative Techniques for Surgical Residents
Spring, 3-0-6
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
SYSE
Department of Electrical Engineering
College of Engineering

410. Systems Methodology
Spring, 3-0-3
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. 3-0-3 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. 3-0-3
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, 4-0-4
P: TE 156, FY 250 or CEP 246. 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 (Leaded States)
Fall, 5-3-5
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 specific disciplines. Teachers' multiple roles and their professional, intellectual, sociopolitical, and communal responsibility.

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

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 practice 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 347, MUS 455 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, 6-2-4
P: TE 402. C: TE 801, TE 802 concurrently. R: Open only to students seeking teacher certification.
Directed and evaluated internship in heterogeneous classrooms. Teaching experience with students with varied learning needs. Theoretical and field-based explorations of common teaching dilemmas.

502. Internship in Teaching Diverse Learners II
Spring, 6-2-4
P: TE 501. C: TE 803, TE 804 concurrently. R: Open only to students admitted to the Teacher Certification Internship-Year Studies Program.
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.

503. Professional Roles and Teaching Practice I
Fall, 3-2-3
P: TE 402. C: TE 801, TE 802 concurrently. R: Open only to students admitted to the Teacher Certification Internship-Year Studies Program.
Recognizing and differentiation between experimental designs. Identification of strengths and weaknesses of research. Recognition and definition of statistical terms and common inferential techniques used in surgical research. Use of computer software in research.

504. Reflection and Inquiry in Teaching Practice II
Spring, 3-2-3
P: TE 502, TE 503, TE 804 concurrently. R: Open only to students admitted to the Teacher Certification Internship-Year Studies Program.
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.

506. Professional Roles and Teaching Practice III
Spring, 3-2-3
P: TE 801. C: TE 502, TE 803 concurrently. R: Open only to students admitted to the Teacher Certification Internship-Year Studies Program.
Recognizing and differentiation between experimental designs. Identification of strengths and weaknesses of research. Recognition and definition of statistical terms and common inferential techniques used in surgical research. Use of computer software in research.

507. Reflection and Inquiry in Teaching Practice IV
Spring, 3-2-3
P: TE 802. C: TE 502, TE 803 concurrently. R: Open only to students admitted to the Teacher Certification Internship-Year Studies Program.
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.
805. **Learning Mathematics**  
(Part of) Interdepartmental with Counseling, Educational Psychology, and Special Education. Administered by Counseling, Educational Psychology, and Special Education.

Learning and developing exponents 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. (3-0)  
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. (3-0)  
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.

810. **History of American Education**  
Spring of odd-numbered years. (3-0)  
Social and intellectual history of educational ideals and institutions. Logics of reform initiatives. Evolution of the education profession.

811. **Philosophical Inquiry and Contemporary Issues in Education**  
Spring. (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. (3-0)  
Relationships of educational organizations and practices to social structures and institutions.

813. **Education, Development and Social Change**  
Spring of odd-numbered years. (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. (3-0)  

816. **Education in Transition**  
Fall of odd-numbered years. (3-0)  
Comparative analysis of change in educational concepts, policies, and practice.

817. **Alternative Perspectives on Human Abilities**  
Spring. (3-0)  
Interdepartmental with Counseling, Educational Psychology, and Special Education. Administered by Counseling, Educational Psychology, and Special Education.


818. **Curriculum In Its Social Context**  
Fall. (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. (3-0)  
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. (3-0)  
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. (3-0)  
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. (3-0)  
Cooperative grouping and heterogeneous learning teams. Impact of learning communities on equity and on school curricula.

824. **Classroom Assessment**  
Fall, Spring. (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. (3-0)  
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. (3-0)  
Interdepartmental with 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. (3-0)  
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. (3-0)  
Uses of technologies in teaching subject matter to diverse learners. Critical perspectives on technologies in schools.

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**Teacher Education — Descriptions of Courses**

840. **Preseminar I: Historical Bases of Literacy Instruction**  
Fall. (3-0)  
R: Open only to graduate students in Literacy Instruction. Relationships between language processes and schooling.

841. **Preseminar II: Psychological Bases of Literacy Instruction**  
Spring. (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. (3-0)  
Methods and materials for teaching developmental and content area reading in grades K-6.

843. **Reading, Writing, and Reasoning in Secondary School Subjects**  
Spring. (3-0)  
Knowledge and methodology for teaching language, literacy, and thinking in selected secondary school subjects.

844. **Classroom Literacy Assessment**  
Summer. (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. (3-0)  
P: One introductory linguistics course. Acquisitions of literacy in schools by language minority students and other learners with diverse backgrounds.

846. **Seminar in Literacy Instruction**  
Spring. (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. (3-0)  
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. (3-0)  
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. (3-0)  
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. (3-0)  
P: TE 849.

Teaching and learning of critical and aesthetic responses to literature for K-12 students.
918. Disciplinary Knowledge and School Subjects
Fall, Spring. 3(3-0)
Cross-disciplinary comparisons of the nature of knowledge, its creation, retention, 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
Fall of odd-numbered years. 3(3-0)

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.

925. 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 922.
Alternative approaches to educational research: qualitative, interpretive, and customized. Theoretical assumptions, sources of questions, data collection and analysis, and rhetoric.

926. Qualitative Methods in Educational Research
Fall. 4(4-0) Interdepartmental with Educational Administration and Counseling, Educational Psychology and Special Education. P: CEP 930. R: Not 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.

927. 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 922 or PSY 71 or CEP 920. One introductory research design or statistics course. R: Open only to graduate students in the College of Education or 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.

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

929. 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.

930. Economic Analysis in Educational Policy Making
Spring of even-numbered years. 3(3-0) Interdepartmental with Educational Administration. Administered by Educational Administration.

931. 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.

932. 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.

933. 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.

934. Language, Literacy, and Educational Policy
Fall of odd-numbered years. 3(3-0)

935. 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
Fall of odd-numbered years. 3(3-0)
"Teacher learning opportunities at the preservice, in-service, 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.

972. 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.

981. Seminar in Curriculum, Teaching, and Educational Policy (MTC)
Spring. 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.

982. 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.

983. Laboratory and Field Experience in Curriculum, Teaching, and Educational Policy
Fall. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

984. Research Practicum in Curriculum, Teaching, and Educational Policy
Fall. 1 to 6 credits. A student may earn a maximum of 4 credits in all enrollments for this course.

A-199
DESCRIPTIONS — TEACHER EDUCATION

COURSES

399. 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

Department of Telecommunication
College of Communication Arts and Sciences

100. The Information Society
Fall, Spring, Summer. 3(3-0) Theoretical 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 118; CPS 101 or CPS 131 or concurrently. R: Not open to freshmen. Operation principles of audio, data and video telecommunication technologies.

240. Telecommunication Media Arts
Fall, Spring, Summer. 4(4-2) 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. Historical development. 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 commercial.

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, MSC 300. Application of advertising and marketing concepts to broadcast stations, cable systems, program networks and telecommunication systems.

361. Telecommunication System and Service Policies
Spring. 3(3-0) P: TC 200, TC 201, TC 310, ACC 290. 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.

422. Advanced Video Design and Production (W)
Fall. 4(2-4) P: TC 342, TC 343. R: Open only to Telecommunication majors. Completion of Tier I writing requirement. Approval of department; application required. Advanced principles of studio and field production. Techniques of design, recording, editing and writing. Emphasis on electronic field production and editing.

443. Audio Industry Design and Management (W)
Fall, Spring. 4(2-4) P: TC 342, TC 343. R: Open only to Telecommunication majors. Completion of Tier I writing requirement. Approval of department; application required. Advanced audio production specializing in multi-channel techniques. Industry focus on all aspects of the audio field.

446. Hypermedia Design
Fall. 3(3-2) R: Approval of department. Current and future hypermedia capabilities. Applications and design of systems.

452. Telecommunication and Information Industries (W)
Spring, Summer. 4(4-0) P: TC 100, TC 200, TC 201. R: Completion of Tier I writing requirement. Telecommunication and information industry issues including economic dynamics, market structures, business practices, and interfaces with other industries.

456. Multi-channel Television (W)
Fall. 4(4-0) P: TC 352, TC 354. R: Open only to Telecommunication majors. Completion of Tier I writing requirement. Television in a multi-channel environment; development in broadcasting, cable, satellite based satellite, microwave distribution systems, and home video applications.

458. Telecommunication Management
Fall, Spring. 4(4-0) P: TC 354, MGT 302. R: Approval of department. Contemporary issues in telecommunication.