and applications of Intelligent Transportation Systems (ITS). 7615 Advanced Highway Design and Traffic Safety (3) S-E Prereq.: permission of instructor. Development and application of highway design principles, particularly as they relate to safety; analysis of accident statistics, design locations, traffic flow characteristics, management, tort liability, and design treatments to address high accident locations; design principles of traffic calming, highway-railroad crossings, highway work zones, and roadway cross-sections.

7621 Mass Transit Systems (3) Prereq.: CE 3600 or equivalent. Introduction to the design, planning, and development of transit systems, focusing on conventional modes of transportation. "S"

7640 Urban Transportation Policy and Planning (3) Prereq.: CE 3600 or equivalent. Introduction to and definition of transportation planning; transportation planning context; characteristics of travel; policies, decision making and models of decision makers; systems analytic approaches to transportation planning; inventory, data management, and spatial representation of data; land use and transportation; inputs to travel forecasting.

7641 Urban Transportation Planning Models (4) S-E Prereq.: CE 7640, ECON 5650, EXST 7003, or equivalent. 3 hrs. lecture, 2 hrs. lab. Travel demand modeling; conventional four-step modeling procedures; network development for highways, transit, high-occupancy vehicles; travel demand forecasting, assignment, and modeling; mode-choice models; highway and transit assignment procedures; use of current software for microcomputers.

7645 Traffic Analysis (3) V Prereq.: CE 7610 or equivalent. Quantitative methods for analysis of transportation systems; basic network algorithms; macroscopic and microscopic traffic simulation models; dynamic traffic assignment approaches; network design problems with travel demand uncertainty; optimization concepts in transportation network modeling.

7560 Bituminous Materials and Mixtures (3) S-O Prereq.: CE 3700 or equivalent. 2 hrs. lecture; 3 hrs. lab. Properties of asphalt and bituminous materials; historical developments; properties and design of bituminous mixtures; theory and practice of asphalt concrete mix design for pavements; specification in construction methods for hot-mixes and surface treatments.

7652 Transportation Engineering - Materials (3) Prereq.: CE 4670 or equivalent. Earth materials—fills and subgrades; aggregates—types, properties, and performance; introduction to asphalt and asphaltic concrete; introduction to cement and cement concrete; variability, QC Curves, stabilization principles and practices; unsealed roads.

7655 Pavement Materials Characterization (4) F-O Prereq.: CE 3700 or equivalent. 2 hrs. lecture; 3 hrs. lab. Laboratory and field tests methods for determining engineering properties of pavement materials; interpretation of test data for pavement design; emphasis on applications to road design and construction.

7672 Pavement Engineering (3) S-O Prereq.: CE 3600 or equivalent. Concepts of Pavement evaluation, pavement performance, serviceability concepts, structural evaluation, pavement rehabilitation and construction; macroeconomic considerations, selection of alternatives, and life cycle cost analysis.

7673 Pavement Maintenance and Rehabilitation (3) S-E Prereq.: CE 3700 or equivalent. Concepts of Pavement maintenance and rehabilitation; pavement evaluation techniques; maintenance versus rehabilitation versus replacement alternatives.

7700, 7701 Special Topics in Civil Engineering (3,3) Prereq.: permission of department. Each course may be taken for a max. of 6 hrs. of credit. Specialized civil engineering areas.

7740 Master’s Report (3) Comprehensive report with oral defense on subject approved by the major professor.

7750 Seminar (1) All graduate students are expected to enroll every semester. Only one semester hour of credit will be allowed toward graduation.

8000 Thesis Research (1-12 per sem.) "S"/T"/U"/grading.

9000 Dissertation Research (1-12 per sem.) "S"/T"/U"/grading.

CLASSICAL STUDIES • CLST

General education courses are marked with stars (★).

1080 Survey of Communication Science and Disorders (3) For students interested in the study of language. Anatomical, physiological, and behavioral bases of normal and disordered verbal behavior. Prereq.: intro to communication sciences. 3 hrs. lecture. Laboratory and field tests methods for determining engineering properties of pavement materials; interpretation of test data for pavement design; emphasis on applications to road design and construction.

1090 Introduction to Language (3) Linguistic study of the principal interrelated levels of language structure: phonology, morphology, syntax, semantics, and pragmatics; topics such as child acquisition of language, handedness, and sign language development.

1201 Death and Roman Civilization (3) Knowledge of Greek and Latin languages not required. Survey of the principal myths of the Greeks and Romans. Thematic approach to various topics related to ancient Greek and Latin civilization.

2010 Aesthetics and Roman Mythology (3) Taught in English; knowledge of the Greek and Latin languages not required. Survey of the principal myths of the Greeks and Romans. Thematic approach to various topics related to ancient Greek and Latin civilization.

2015 The Archaeology of Ancient Greece (3) Also offered as ANTH 3015. Maternal culture of the great civilization of ancient Greece; includes Neolithic Age, Bronze Age, and the Age of Alexander the Great.

2300 Classical Epic in Translation (3) Knowledge of Greek and Latin languages not required. Growth and development of the Greek and Latin epic; basic themes, the culture of a hero, and relevance to modern readers.

3032 Greek and Roman Tragedy in English Translation (3) Taught in English; knowledge of Greek and Latin languages not required. Courses in the classical civilization of ancient Greece and Rome; odes, maxims, major examples, and relevance; plays of Aeschylus, Sophocles, Euripides, and Seneca.

3340 Reading Comedy in English Translation (3) Knowledge of Greek or Latin languages not required. Masters of stage comedy from the ancient world, with special attention to Aristophanes, Terence, and Tiberius Gracchus. Origins and growth of comedy as an art form; problems in staging; social nature of comedy in the ancient world.

3505 Speech and Language Development (4) Knowledge of Greek and Latin languages not required. May be repeated for a max. of 6 sem. hrs. of credit when combined with COMD 3090.

3509 Comparative Mythology (3) Prereq.: CLST 2090 or permission of instructor. Also offered as REL 3090. Introduction to myths from around the world with comparisons to Greek and Roman mythology.

COMMUNICATION DISORDERS • COMD

General education courses are marked with stars (★).

3800 Speech and Language Development (4) Also offered as LING 4380. 3 hrs. lecture; 1 hr. lab. Language acquisition and development, behavior, and language disorders; principles of phonetics, art, and perception; speech pathology and audiology. 3 hrs. lecture; 1 hr. lab. Learning principles of phonetics; articulatory phonetics; description and classification of sounds; transcription at different levels of detail; production and perception.

4153 Acoustics of Speech and Hearing (3) Prereq.: COMD 2050 or equivalent. Also offered as LING 4153. Production, transmission, and perception of speech and hearing.

4150 Phonetics (4) Prereq.: COMD 2050 or equivalent. 3 hrs. lecture; 1 hr. lab. Also offered as LING 4150. Principles of phonetics; articulatory phonetics; description and classification of sounds; transcription at different levels of detail; production and perception.

4153 Acoustics of Speech and Hearing (3) Prereq.: COMD 2050 or equivalent. Also offered as LING 4153. Production, transmission, and perception of speech and hearing.

4250 Anatomy and Physiology of Speech and Hearing (3) Prereq.: COMD 2050. Functional anatomy of structures beginning with the ear and nasopharynx.

4380 Speech and Language Development (4) Also offered as LING 4380. 3 hrs. lecture; 1 hr. lab. Language acquisition and development, behavior, and language disorders; principles of phonetics, articulatory phonetics; description and classification of sounds; transcription at different levels of detail; production and perception. 3 hrs. lecture; 1 hr. lab. Learning principles of phonetics; articulatory phonetics; description and classification of sounds; transcription at different levels of detail; production and perception.

4381 Basic Articulation Disorders (3) Prereq.: COMD 2050, 4150. Introduction to articulation physiology, development, etiology, evaluation and treatment of disorders.

4382 Basic Language Disorders of Children (3) Prereq.: COMD 2050 or equivalent. 3 hrs. lecture; 1 hr. lab. Specific language disorders of children; assessment and treatment. 3 hrs. lecture; 1 hr. lab. Specific language disorders of children; assessment and treatment. 3 hrs. lecture; 1 hr. lab. Specific language disorders of children; assessment and treatment. 3 hrs. lecture; 1 hr. lab. Specific language disorders of children; assessment and treatment.

4383 Basic Voice Disorders (3) Introduction to physiology, dynamic characteristics and measurement of fundamental frequency, and differential diagnosis and management of voice disorders of functional and abusive etiology.

4490 Audiolingual Assessment (3) Prereq.: COMD 4250, 4190. Practice and application in pure-tone and speech audiometry; middle-ear measurements, differential diagnosis; physiological tests including auditory evoked potentials.

4590 Auditory Rehabilitation in Children (3) Prereq.: COMD 4153, 4190. Methods of management including medical, audiological, psycho-educational, and behavioral techniques. Prereq.: COMD 4150, 4250, 4280, 4285. Clinical Practice: Therapeutic Techniques (1-6 each) Prereq.: COMD 4282 and credit in course work related to practicum-specific speech, language, or hearing disorder. May be taken for a max. of 8 sem. hrs. of credit each. On- and off-campus practice in speech, language, and hearing disorders.

4591 Clinical Practicum in a Medical Environment (1-4) Prereq.: consent of instructor. Speech and/or audiologic practicum in a hospital or medical practitioner's office.

4750 Independent Research in Speech Science or Linguistics (1-3) May be taken for a max. of 3 hrs. of credit. Also offered as LING 4750. Readings in speech science or linguistics directed by a senior faculty member.

4751 Special Topics in Communication Disorders (3) May be taken for a max. of 3 hrs. undergraduates or graduate credit when topics vary.

4752 Survey of Adult Neurogenic Communication Disorders (3) Prereq.: COMD 4150 or equivalent. A survey of the model of health provides structure for study of basic neuroanatomy, assessment, treatment, and social consequences of adult neurogenic communication disorders.

7071 Speech Science (3) Motor and articular phonetics, including palatography, acoustic phonetics, and aspects of signal detection and perception.

7152 Instrumentation and Methods for Speech and Hearing (4) Prereq.: COMD 4153 or equivalent. 3 hrs. lecture; 2 hrs. lab. Instrumentation techniques for assessment and research in speech and hearing; both theory and application are emphasized.

7153 Research Design in Communication Science and Disorders (3) Prereq.: EXST 4001, 4006 or equivalent. Empirical research design problems in speech and hearing; emphasis on measurement validity and reliability.

7191 Hearing Science (3) Prereq.: COMD 4250. Auditory transmission and processing from the outer ear to the auditory nerve; psychophysical phenomena germane to human audition.

7192 Hearing Aids: Electroacoustics and Fitting (3) Prereq.: CD 7191, 7409. Acoustic properties of hearing aids, earmold acoustics, selection and evaluation procedures, special devices, and problems in communica-

7280 Neuroanatomical Bases of Speech and Hearing (3) Prereq.: BIOL 2100 and COMD 4250 or equivalent. Study of anatomy and physiology of the central nervous system as it relates to sensory/motor and cognitive processes underlying speech and hearing.

7281 Language and Learning Disorders (3) Prereq.: COMD 4382. Language disorders and the communicative
aspect of language; current research and treatment models for language intervention; relationship between language and learning disabilities in children.

7382 Voice Disorders (3) Prereq.: COMD 4384. Incidence, etiology, concomitant problems; assessment and management of voice, speech, and language disorders.

7383 Cleft Palate/Orofacial Disorders (3) Prereq.: COMD 4250, 4380. Orofacial anatomy, physiology, and embryology; etiology and treatment of cleft palate; speech, hearing, and psychosocial concomitants and their management.

7384 Communication Interventive Prac (3) Prereq.: COMD 4382 or equivalent. For practical experience, take COMD 7684 or 7685. Cognitive, social, and environmental conditions of high risk for communicative disorders; intervention approaches (prevention, evaluation, direct stimulation of child-caregiver interactions) and service delivery models (home-based, center-based).

7385 Neuropsychologies of Speech (3) Prereq.: COMD 4250, 4381, and 7280: equivalent. Physiological and anatomical bases of dysarthria, apraxia, and related speech disorders due to neuropathology in the adult population; emphasis on diagnosis, description, and clinical management.

7386 Introduction to Augmentative/Alternative Communication (3) Current issues, terminology, and technological developments; augmentative systems and techniques; computer systems and components, including various sign and symbol systems; telecommunication assistive devices; intervention guidelines and procedures.

7387 Aphasia in Adults (3) Prereq.: COMD 7280 or equivalent. Aphasia and related disorders; appropriate therapeutic methodologies.

7388 Aphasia in Children (3) Prereq.: COMD 4385 or equivalent. Etiology and nature of speech fluency disorders.

7389 Communicative Rehabilitation of Severely/Multiply Handicapped Individuals (3) Prereq.: COMD 4384. Medical bases of life threatening handicapping conditions; alternate communication systems; assessment and intervention processes; pragmatics of interpersonal communicating involving individuals who use nonverbal means.

7390 Auditory Neuropsychology (3) Prereq.: COMD 7390. Audiological processes in industry and hearing conservation programs; professional, technical, business, and legal issues.

7391 Auditory Neuropsychology (3) Prereq.: COMD 7390. Identification and management of the young child; social and psychological concomitants of auditory disorders; genetic hearing loss and other high risk types of impairment related to hearing.

7393 Pathology of the Auditory System (3) Prereq.: COMD 4382 or equivalent. Neurological bases of dysarthria, apraxia, and related speech disorders due to neuropathology in the adult population; emphasis on diagnosis, description, and clinical management.

7394 Measurement and Diagnosis of Communication Disorders (3) Psychological and behavioral measurement of communication disorders and treatment planning for common speech/language disorders.

7395 Auditory Rehabilitation of Adults (3) Prereq.: COMD 7390. Audiological processes in industry and hearing conservation programs; professional, technical, business, and legal issues.

7396 Clinical Practice (1-6 each) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. For advanced graduate students who wish to pursue research on special problems exclusive of thesis or dissertation.

7754 English for Speakers of Other Languages: Methods and Materials (3) Also offered as LING 7755. Problems of teaching second languages; assess and develop strategies for spoken language; discourse analysis, theoretical foundations, second language acquisition, and development of a teaching syllabus; work with international students.

7755 English for Speakers of Other Languages: Methods and Materials (3) Also offered as LING 7755. Problems of teaching second languages; assess and develop strategies for spoken language; discourse analysis, theoretical foundations, second language acquisition, and development of a teaching syllabus; work with international students.

7756 Independent Research: Phonetics and Linguistics (1-3) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. For advanced graduate students who wish to pursue research on special problems exclusive of thesis or dissertation.

7761 Independent Research: Speech Science (1-3) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. For advanced graduate students who wish to pursue research on special problems exclusive of thesis or dissertation.

7781 Independent Research: Communication Disorders (1-3) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. For advanced graduate students who wish to pursue research on special problems exclusive of thesis or dissertation.

7782 Individual Research in Communication Disorders (3) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. For advanced graduate students who wish to pursue research on special problems exclusive of thesis or dissertation.

7783 Dysphagia (3) Prereq.: COMD 4250. 7280. Chronic and acute dysphagia; swallowing disorders in children and adults occurring secondary to neurological or structural deficits.

7789 Seminars in Communication Disorders (3) Prereq.: consent of instructor. May be repeated for credit. Exploration of current professional/scientific topics in clinical practice research.

7799 Seminar in Communication Disorders (1-3) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. For advanced graduate students who wish to pursue research on special problems exclusive of thesis or dissertation.

7850 Experimental Phonetics (3) Prereq.: PhD standing and permission of instructor. May be taken for a max. of 6 hrs. of credit when topics vary. Current research and modeling of the quantitative representation of human speech.

7853 Psychosoundsciences (4) Prereq.: COMD 7191. 3 hrs. lecture; 3 hrs. lab. Admission to program required. Classic and contemporary readings about perception of sound, language, and cultural values; emphasis on the detection theory, frequency processing, pitch perception, intensity processing, binural hearing and temporal acuity.

7854 Psychological Acoustics (3) Prereq.: COMD 7191 and admission to doctoral program. Auditory system structure and function; physiological acoustics and psychoacoustic correlates.

7880 Advanced Seminar in Language Disorders (3) May be taken for max 6 sem. hrs. credit when topics vary. Theory, contemporary issues, and research related to language disorders as a method of inquiry and intervention; evaluation of research methodology.

7882 Advanced Research in Communication Science and Disorders (1-6) Prereq.: admission to PhD program and consent of instructor. May be taken for a max. of 6 hrs. of credit when topics vary or excursion to dissertation research.

8000 Thesis Research (1-12 per sem.) $7/7U. grading. 9000 Dissertation Research (1-12 per sem.) $7/7U. grading.

**COMMUNICATION STUDIES**

- **CMST**
  - General education courses are marked with stars (★)
  - ★ 1061 Fundamentals of Communication (3) The practice of rhetoric, research, and teaching communication theory; extensive practical and performance applications of communication skills in addition to lectures and readings.
  - ★ 1507 Introduction to Communication Studies (3) Not a substitute for CMST 1061, 2040, 2060, or 2064. Fundamental perspectives and subtopics areas in the study of human communication.
  - ★ 2010 Interpersonal Communication (3) Theories and research on human communication; one-to-one interactions.
  - ★ 2011 Introduction to Communication (3) The study of interpersonal interaction; reading, analysis, and performance of prose, poetry, and drama.
  - ★ 2060 Public Speaking (3) Theory and skills needed by the effective communicator; including the delivery of oral presentations through analysis of other speakers and practice in speaking.
  - 2061 Communication for Business and the Professions (3) For students in business, engineering, and the professions, the E. J. Ourso College of Business. Course in use.