

Dersler	Catalog Description
ME 557 Advanced Gas Dynamics	Introduction to the steady one-dimensional compressible flow. Steady one-dimensional isentropic flow with area change. Standing Normal Shocks. Moving and oblique shocks. Prandtl-Meyer expansion waves. Adiabatic flow through a constant area duct with friction: Fanno flow. Frictionless flow through a constant area duct with heat transfer: Rayleigh flow. Real gas effects. Gas dynamics and propulsion systems.
ME 567 Combustion Theory	Combustion and thermochemistry. Chemical kinetics. Chemical mechanisms. Coupling of chemical and thermal analysis of reacting systems. Conservation equations for reacting flows. Laminar premixed flames. Two-Phase flow and combustion. Turbulent flow. Turbulent premixed flames. Turbulent non-premixed flames. Pollutant emissions.
EE 562 Economic Operation of Power Systems	Modern power system operation. Economic dispatch. Unit commitment. Hydrothermal coordination. Interchange evaluation, power pools, and markets. Smart grid concept and applications. Forecasting techniques for the power demand, wind and solar generation.
MATH 222 Linear Algebra II	Matrix Representations of Linear Transformations. Eigenvalues and Eigenvectors. Diagonalization. Jordan Canonical Forms. Cayley-Hamilton Theorem. Minimal Polynomials. Rational Canonical Forms. Inner Product Spaces. Orthogonalization. Normal and Self-Adjoint Operators. Unitary and Orthogonal Operators. Bilinear and Quadratic Forms.
PSY 342 Psychopathology	Distinguishes between normal behavior and psychological disorders such as stress disorders, anxiety problems and depression, schizophrenia, and addictive behaviors. Causes and treatments of psychological problems and disorders
IE 446 Design of Experiments	Basic principles of design of experiments. Simple comparative experiments. Experiments with a single factor. Experiments with multiple factors with two or mixed levels. Basic response surface designs. Analysis of variance and regression for the experimental designs.
ME 336 Modeling and Control of Dynamic Systems	Introduction to automatic control. Modeling of dynamic systems. Response analysis using Laplace transform method. Transfer functions and block diagrams. Feedback control systems. Typical actuators and transducers. Control Laws. Tuning methods of PID control. Root-Locus analysis. Frequency response analysis.
ME 362 Heat Transfer	Modes of heat transfer: Conduction, convection and radiation. Steady and transient, one and multi-dimensional heat conduction in systems: numerical methods and special applications. Internal and external laminar and turbulent forced convection. Heat transfer by radiation. Fundamentals of heat exchangers.
PSCG 405 Ethical Decision Making in Counseling	The professional ethical laws in counseling area and general application standards. Client rights. Legal responsibilities of counselors. Legal problems. Multiculturalism and individual differences.
PSCG 440 Culturally Sensitive Counseling	The importance of cultural differences. Increasing cultural awareness and cultural sensitivity. Awareness of own cultural characteristics, diversity, and professional cultural competencies. Counseling theories cross-culturally. The role of cultural case formulation in counseling and therapy.
TEDU 120 Career Planning	Career planning skills, career development needs and interests, discovering personal competencies, career awareness, career information resources, exploration of career options, career decision making skills, CV preparation.
SOC 423 Gender and Sexuality	The History and Theory of Gender; Intersectionality; Introduction to Queering Identities; Theory and Practice of Gender Equality; Gender and Law; Gender and Sexuality Diversity and Inclusion in the Workplace.
PSY 244 Sports Psychology	Foundations of sport psychology. Application of psychological concepts and approaches on broad range of sports field. Individual approaches such as motivation, anxiety management, concentration. Group processes such as team cohesion, role performance, group dynamics and communication. Social aspects of sports as with topics like aggression and leadership.
PSY 344 Theories of Child Psychotherapy	Historical presentation of theories of child psychotherapy. Overview of psychoanalytic psychotherapy, cognitive behavioral psychotherapy, and contemporary theories of psychotherapy such as play therapy and schema therapy. Discussion on empirical effectiveness of psychotherapy approaches.
PSCG 204 Theories of Counseling	Mainstream counseling theories and approaches. Basic concepts, principles, and strategies in counseling theories and approaches. Conceptualizing and evaluating the problems of the counselee within the framework of mainstream counseling theories.
PSCG 202 Social Psychology	The content of social psychology and its research methods. Social perception and social cognition. Attitudes and attitude change theories. Psychological processes affecting social behavior. Social influence and conformity behavior. Group dynamics. Interpersonal relations.
PSCG 403 Career Counseling and Guidance	Basic concepts and principles regarding career guidance and counseling. Theories of career development. Measurement in career guidance and counseling. Computer based career guidance and counseling. Career guidance and counseling programs.
PSCG 402 Practicum in School Counseling 2	The examination of educational, occupational and personal/social guidance and psychological counseling activities which take place at pre-schools, primary schools, secondary schools, and high schools; the interpretation and application of testing and non-testing techniques; developing and applying group guidance programs on preventive and protective guidance topics.
PSCG 406 Psychopathology	History of psychopathology and mental health disorders. Definitions of abnormal behaviors. Basic concepts of psychopathology. Psychological assessment. Diagnostic criteria of DSM-V. Mental health disorders in DSM-V. Intervention and referral strategies.
PSCG 401 Practicum in School Counseling 1	Investigation of educational, vocational and personal / social guidance and psychological counseling activities in preschool, primary, secondary and high schools, application and interpretation of test and non-test techniques; Development and implementation of group guidance programs on various topics.
VIP 500 Vertically Integrated Project I	Vertically integrated research, experiential learning, addressing real-world challenges, professional development within an interdisciplinary research team.
VIP 600 Vertically Integrated Project I	Vertically integrated research, experiential learning, addressing real-world challenges, professional development within an interdisciplinary research team.
CMPE 113 Fundamentals of Programming I	Variables. Assignment statements. Built-in data types. Conditions. Loops. Arrays. Input and output management.

CMPE 361 Computer Organization	Instruction set and architecture of a computer. Branching and procedure calls. Addressing modes. Single-cycle processor datapath. Single cycle control. Pipelining. Pipeline hazards and forwarding. Performance. Advanced micro-architectures. Memory system performance and memory hierarchy. Virtual memory and Paging. Memory mapped Input/Output. Parallel and serial Input/Output devices.
CMPE 114 Fundamentals of Programming II	Classes. Objects. Operator overloading. Packaging. Linked lists. Queues. Stacks. Searching and sorting algorithms.
CMPE 223 Data Structures and Algorithms I	Design and Analysis of algorithms. Stacks and queues. Elementary sorts. Mergesort. Quicksort. Priority queues. Heaps. Symbol tables. Binary search trees. Balanced search trees. Hash tables.
CMPE 224 Data Structures and Algorithms II	Undirected graphs. Directed graphs. Minimum spanning trees. Shortest paths. Maximum flow and minimum cut. Radix sorts. Tries. Substring search. Regular expressions. Data compression. Reductions. Intractability.
CMPE 232 Database Systems	Database system concepts and architecture. Relational databases and SQL. Database normalization. File structures and indexing. Transaction processing and concurrency control. NoSQL databases.
CMPE 252 C Programming	Computer architecture. Input and output. Functions and prototypes. Pointers. Strings. Structures. File handling. Preprocessor. Basic software deployment.
CMPE 326 Concepts of Programming Languages	Fundamental programming language concepts, pointer arithmetic, dynamic memory allocation, strongly and dynamically typed languages, subprograms and parameter passing methods, abstract data types, encapsulation.
CMPE 327 Theory of Computation	Deterministic and non-deterministic finite automata. Regular expressions. Context free grammars. Push down automata. Turing machine. Decidability and undecidability. P and NP classes. Fundamental problems.
CMPE 371 Signals and Systems for Computer Engineers	Concepts of signals and systems, linear time-invariant systems, fourier series representation of periodic signals, continuous-time fourier transform, discrete-time fourier transform, time and frequency characterization of signals and systems, sampling.
CMPE 382 Operating Systems	History of operating systems and computer hardware. Address space. Files. Input/output. The kernel. System calls. Processes and threads. Memory management. File systems. Multiple processor systems. Security
CMPE 399 Summer Practice I	Summer internship done for a minimum of 20 consecutive working days at a computer firm or an IT department. Presentation of experiences, and systems and software developed over the internship.
CMPE 421 Artificial Intelligence	History of programming languages for AI. Introduction to Lisp programming. Problem solving with computers. Search strategies, game playing. Knowledge and reasoning. Knowledge representation. First-order logic, inference. Learning, inductive and statistical learning methods, Robotics systems.
CMPE 453 Embedded Systems	Basic components of a single-board computer. Microprocessors and micro controllers. Microcontroller based systems. AVR and ARM Microcontrollers, Embedded C coding. Input and output (I/O) ports. Basic I/O protocols. Serial communication, Interrupts.
CMPE 472 Computer Networks	Communication model. Protocol architecture. OSI. TCP/IP. Wide area networks. ATM. Switching. Cellular wireless networks. Local area networks. High speed LANs. Wireless LANs. Internetworking. IPv6. TCP congestion control. UDP. Network security.
CMPE 491 Senior Project I	Project proposal. Literature review. Requirement analysis. Design.
CMPE 492 Senior Project II	Testing document. Project design and implementation. Quality processes (verification and validation).
CMPE 499 Summer Practice II	A 20-day summer internship at a computer firm or IT department, focusing on advanced project development, problem-solving, and collaboration. Design and implementation of complex systems and software solutions. Presentation of experiences and developed projects.
EMT 204 Materials Design in Mathematics Education	Material design principles. In the context of mathematics education, the types and purposes of instructional materials, the processes of designing instructional materials from a sustainability perspective. Determining material needs, adapting pre-existing instructional materials to specific instructional objectives. Integrating community service, design thinking, and artificial intelligence elements into the instructional material design, implementation and evaluation process.
CE 571 Sustainable Construction	Introduction to sustainability in construction. Green buildings. Ecological design. Green building evaluation and certification systems. Design process of green buildings. Green construction operations. Green buildings economics. Case studies with recent technology.
ELT 616 Contemporary Trends in Research Methods	Recent and future directions of research and research methods in second language learning and teaching; new approaches, research design, data collection and analysis techniques of quantitative, qualitative, and mixed method design; critical analysis of the research papers using contemporary research methods.
ME 695 Ph.D. Dissertation III	Ph.D. dissertation studies performed under supervision of an academic advisor.
ME 696 Ph.D. Dissertation IV	Ph.D. dissertation studies performed under supervision of an academic advisor.
VIP 200 Vertically Integrated Project I	Vertically integrated research, experiential learning, addressing real-world challenges, professional development within an interdisciplinary research team.
PSY 510 Statistical Methods for Advanced Clinical Research	In-depth understanding of advanced regression methods. Simple linear regression; multiple linear regression; interactions; categorical and continuous variables, and related topics. Designing and conducting statistical analysis; interpreting the results; drawing implications for the research problem.
PSY 514 Clinical Supervision I	Supervised clinical case management; issues related to clinical practice; case formulation /management; therapy plan and strategies; therapeutic relationship; consultation; ethical considerations.
PSY 515 Clinical Supervision II	Supervised clinical case management; issues related to clinical practice; case formulation /management; therapy plan and strategies; therapeutic relationship; consultation; ethical considerations. Continuation of Clinical Supervision I.

PSY 530 Ethics in Clinical Psychology	Ethical principles and guidelines for clinical psychologists. Standards of clinical practice, laws and regulations. Research ethics. Case discussions related to ethical issues and dilemmas.
PSY 532 Advanced Competencies in Clinical Interviewing	Theoretical and practical knowledge and skills related to clinical interviewing. Ethics of clinical practice. Therapist-client relationship. Structure of clinical interview. Clinical case formulation. Developing treatment plan. Clinical report writing.
PSY 590 Graduation Project	Completion of a graduation project in the field of Clinical Psychology. Written report and oral presentation.
PSY 520 Contemporary Approaches to Psychotherapy	Current psychotherapy approaches such as acceptance and commitment therapy (ACT), dialectical behaviour therapy, and multicultural psychotherapies; similar and different aspects of psychotherapy approaches; new concepts and techniques introduced by psychotherapy schools; case studies; a critical perspective on studies on the effectiveness of psychotherapies.
PSY 553 Foundations of Family Therapy	Family systems perspective and concepts. Historical roots of family therapy. Main schools of family therapy. Methods and principles in family therapy practice. Contemporary approaches and practices in family therapy.
PSY 555 Clinical Case Formulation	Clinical formulation in psychotherapy via case examples. Forming hypothesis. Developing a treatment plan based on case formulation.
PSY 557 Play Therapies	Importance and function of play in the psychosocial development of children and adolescents; use of play for assessment and intervention purposes; elements of play therapy; play therapy approaches and techniques; application of play therapy for various psychological problems; supervised play sessions.
PSY 564 Implementation of Disaster Psychosocial Interventions	Practical application of disaster psychosocial interventions targeting diverse populations and risk groups; hands-on disaster fieldwork; peer support mechanisms, promotion of self-care strategies within the context of disaster response.
PSY 575 Psychotherapy of Children and Adolescents	Theoretical frameworks for psychotherapy approaches for children and adolescents; observation, assessment, diagnosis, and treatment planning; evidence-based interventions utilized for commonly encountered developmental, social, and behavioral issues in childhood and adolescence; ethical issues within the framework of child and adolescent psychotherapy; case examples.
PSY 576 Clinical Assessment in Children and Adolescents	Tracking development of a child and identifying deviations from normal development on the basis of cognitive, emotional and social assessment; early identification of children at risk; application, scoring, interpretation and reporting findings of the assessment tools developed for children and adolescents.
PSY 577 Advanced Perspectives on Life Span Development	Origin, continuity, and the nature of developmental changes in the human behavior across the life span; current research trends and debates within the field of developmental science.
PSY 581 Relational Dynamics in Psychotherapeutic Practice	Effectiveness, efficacy, outcome, and process research conducted in the field of psychotherapy in the last 30 years; therapeutic relationship as a common factor in different forms of psychotherapies; various perspectives on therapeutic relationship from neuropsychological to psychodynamic approach.
PSY 582 Advanced Developmental Psychopathology	Understanding psychological problems in the context of human development; developmental origins and developmental consequences of social, emotional, and behavioral disturbances in childhood and adolescence; examination of the characteristics, course, and etiology of childhood disorders on early development including, social, cognitive, biological, and psychological influences, treatment strategies for mental disorders among children and adolescents.
PSY 583 Community Well-being and Clinical Psychology	The ecological model and psychological issues and its relation to wider social environment, fundamental principles and theories of community psychology; the influence of stress and social support on individuals; the significance and appreciation of human diversity; strategies for prevention of psychological issues; the empowerment of individuals, groups, and communities; consultation and initiatives for community transformation; psychosocial interventions; and the functions of clinical psychologists engaged in community-oriented efforts.
PSY 584 Childhood Parental Psychopathology	Advanced adult psychopathology. Manifestations of parental psychopathology in family and child mental health. Parental psychopathology and its effects on child psychotherapy.
PSY 585 Integrative Models of Psychopathology	Risk factors and etiology of adult psychopathologies from the perspective of neuro-developmental theories; current empirical evidence related to neuro-developmental approaches from an integrative perspective.
PSY 586 Family Systems Theory	Family as a system; systems approach, family systems theory; family development theory; stages of family life-cycle.
PSY 694 Doctoral Dissertation III	Conducting an independent, supervised research in the field of clinical psychology to be written in doctoral dissertation format.
PSY 659 Practice of Disaster Psychosocial Interventions	Practical application of disaster psychosocial interventions targeting diverse populations and risk groups; hands-on disaster fieldwork; peer support mechanisms, promotion of self-care strategies within the context of disaster response.

ED 591 Pre-thesis Seminar	Processes related to curriculum and instruction: literature review, scientific research methods, data collection, data analysis, reporting.
ED 592 Master's Thesis I	Research project in the area of specialization. Application of scientific research processes. Report. Presentation of the results.
ED 593 Master's Thesis II	Research project in the area of specialization. Application of scientific research processes. Report. Presentation of the results.
ED 590 Graduation Project	Researching a subject related to curriculum and instruction under the supervision of an advisor in accordance with scientific research processes; reporting and presenting the results.
ED 581 Research Methods and Scientific Research Ethics	Examining the research process (problem identification, data collection, data analysis and interpretation of results) in curriculum and instruction; reviewing scientific research methods; literature review; ethics and ethical problems in research; data collection, analysis, and interpretation; writing reports.
ED 501 Curriculum Development	Comprehending the basic concepts of curriculum development; examining curriculum approaches; curriculum foundations and models; issues and trends in curriculum development and analyzing current formal education curricula in the light of this information; examining curricula of different subject areas; researching curriculum development studies, and tracing the history of curriculum development and evaluation; developing and implementing a disciplinary or interdisciplinary curriculum.
ED 502 Curriculum Evaluation	Curriculum and curriculum evaluation; basic approaches and models in curriculum evaluation; planning, implementing and reporting a curriculum evaluation project.
ED 503 Instructional Design	Instructional design models and approaches. Instructional design process. Designing and developing content, materials, instructional strategies and assessment practices appropriate to learning outcomes. Developing, applying and evaluating a sample instruction in a selected subject area.
ED 504 Adult Education and Lifelong Learning	Characteristics and motivations of adult learners; theories of adult learning and intelligence; modes of adult cognitive and psychosocial development; teaching adults; research in adult and continuing education.
ED 505 Advances in Educational Psychology	Current theory, research, practice, and advances in educational psychology; theories of learning and development and their impact on teaching and learning processes; research methods in educational psychology; concepts related to learning such as diversity and inclusion; factors affecting learning and motivation; impacts of culture and community on learning process.
ED 506 International Large Scale Assessments in Education	Provides a comprehensive exploration of large-scale assessment practices in education; covers the foundational concepts of traditional and standardized forms of assessment, including achievement tests and questionnaires; critically analyzes the design and implementation of large-scale assessment items, considering factors such as validity, reliability; examines key variables addressed in large-scale assessments and compares and contrasts Classical Test Theory and Item Response Theory; covers the scale development process and have the opportunity to develop new item types relevant to large-scale assessments.
ED 507 Assessment and Evaluation in Education: Research and Practice	Assessment and evaluation as key processes in a curriculum. Current issues and developments in classroom-based summative and formative assessments. Teachers' measurement and assessment literacy level. Key concepts and case studies in research on educational assessment and evaluation.
ED 508 Test Construction	Basic concepts used in measuring achievement; measurement tools used in education; types of open-ended items; types of rubrics; cognitive features measured in education; test construction process; standard tests; item structures in large-scale tests in real-life situations; assessment and evaluation of 21 st century skills and metacognition.
ED 509 Advanced Instructional Technologies and Pedagogies	Advanced instructional technologies and pedagogies; emerging instructional technologies; designing technology-enhanced learning activities; innovative pedagogical strategies to enhance learning experiences; design principles used in integrating technology; analysis of the usage of various technologies; ethical considerations, accessibility issues, digital divide.
ED 510 Introduction to Educational Statistics	Basic concepts of statistics; grouping of data; measures of central tendency; measures of variability and checking the normality of distributions; parametric and nonparametric statistical methods.
ED 512 Qualitative Research in Education	Qualitative research approaches; qualitative research methods; qualitative data analysis; advantages and disadvantages of qualitative research; objectivity and subjectivity in qualitative research; conceptualization and observation; interview and reflexivity; analysis; reporting; interview practice.

ED 514 Curriculum Theory and Practice	Curriculum definition; overview of curriculum studies; types of curricula; the source of curriculum goals; the relationship between power, ideology and curriculum; curriculum policy development; factors affecting the curricula; relationship between curriculum and school; curriculum implementations; planned and enacted curriculum; discourse of inadequacy and curriculum.
ED 522 Advanced Studies in Teaching Social Studies	Knowledge and skills in social studies education; the aim and skills of social studies education; literacy in social studies; the main themes in social studies; examination of social studies curriculum; instructional strategies in social studies; democracy, human rights, and values education in social studies.
ED 524 Advanced Studies in Teaching Turkish Language	Current approaches used in teaching Turkish; improving language skills; eliminating reading and writing difficulties; structure of reading and writing texts; improving media literacy; use of technology in language teaching; assessment of language skills; examining the primary school Turkish curriculum and its relationship with other curricula.
ED 526 Advanced Studies in Teaching Science	Basic concepts in science education; characteristics of science, technology, and scientific knowledge; scientific literacy; science, technology, society, and environment relationship; attitudes towards science; the goals of science education; constructivism and science learning.
ED 528 Advanced Studies in Teaching Mathematics in Primary School	The aim and basic principles of primary school mathematics teaching; learning theories in mathematics; teaching strategies in primary school mathematics; misconceptions and learning difficulties in primary school mathematics; assessment in primary school mathematics; contemporary research in the field of primary school mathematics education.
ED 532 Advanced Studies in Teaching Mathematics in Middle School	Analysis of the national middle school mathematics curriculum and international standards and frameworks (NCTM, CCSS, IB, etc.); learning domains and process skills related to middle school mathematics. In-depth exploration of specific mathematical domains, including numbers and operations, geometry and measurement, algebra, probability, and data. Effective teaching strategies in the context of middle school mathematics education. Contemporary research in the field of middle school mathematics education.
ED 534 Activity and Instructional Material Design in Teaching Mathematics	In-depth exploration of instructional material and activity design in mathematics education. Research studies on activity and instructional material design in mathematics education. The role of activities and instructional materials in learning. Underlying principles, methodologies, and significance of designing and implementing instructional materials and activities in mathematics education. Evaluation of sample activities and instructional materials. Domain-specific activities, instructional materials, instructional technologies, software types and their specialized purposes. Design thinking process. Design of instructional materials and activities considering specified classroom cases. Evaluation of instruction enhanced by material use.
ED 538 Game-based Learning Design in Mathematics	Game and game types; the importance of games in mathematics teaching; theoretical approaches regarding using games in mathematics teaching; mind, mathematics, types of mind games; the interaction between mathematics and game; examination of Mind Games Course; integration of mind games to mathematics teaching; technology supported mathematics games.
ED 542 Data-driven Mathematics Instructional Design	The concept of instructional design; instructional design models; the importance of data in the learning environment; data collection strategies in the classroom; learning analytics; educational data mining; making design decisions based on classroom data for mathematics teaching; designing mathematics teaching in light of data.
ED 544 Differentiated Mathematics Instruction	The purpose, significance, and necessity of differentiation in education. The relationship between differentiated instruction and an inclusive learning environment. The theoretical foundations of differentiation in education. The principles of differentiated instruction. The design, implementation, and evaluation of differentiated mathematics instruction. Examples of differentiated mathematics instruction.
ED 520 Educational Design Research	Systematic process of planning, implementing, analyzing, and revising effective instructional innovations from a design-based research perspective. Various forms of design-based research with a focus on both specific content domains as well as broader implementations in the field of education. Practicum of a small-scale design-based research project.
ED 410 Intercultural Communication in Education	The definition and conceptualization of intercultural communication as a communicative and pedagogical tool in education. Misconceptions of intercultural communication. Barriers of intercultural communication and educational strategies to remove the barriers. Policy and international projects in relation to intercultural communication. Approaches commonly used in intercultural communication. Sustainable peace development, democracy and advocacy in teaching intercultural communication to students, and school community. Whole school approach for improving harmony among diverse student groups in the school.

ED 420 Large Scale Assessments in Education	History of psychological testing, different types of tests and comparison of these tests, theoretical frameworks of standardized tests, characteristics of large scale assessments in education; traits and skills addressed in large scale assessments, item types addressed; development process of large scale assessment tests, examples and their comparison; scoring procedure of these tests and, variables addressed in questionnaires administered.
SOC 401 Graduation Project and Seminar I	Project Topic Selection; Literature Review; Research Question Development; Conceptualization and Operational Definition; Instrumentation; Field Research; Quantitative Research Methods and Data Analysis; Reporting Results.
SENG 499 Summer Practice II	Summer internship done over 30 consecutive working days at a computer firm or an Information Technologies department. Presentation of experiences, and systems and software developed over the internship.
EE 309 Fundamentals of Electrical and Electronics Engineering	Basic electrical and electronic components and circuits. Circuit analysis. Analysis of first-order circuits. Phasors. Steady-state alternating current analysis. Fundamentals of electromechanical energy conversion. Alternating current power. Three-phase power. Transformers. (Offered for non-EE students.)
ME 399 Summer Practice I	Minimum 20 working days of practical work in an organization operating on the production of mechanical or thermal systems.
ME 499 Summer Practice II	Minimum 20 working days of practical work in an organization operating on the design, production, maintenance, management of mechanical or thermal systems.
EE 451 Digital Electronics	Diode and transistor models used in logic gates. Dynamic behavior of logic gates: fall-time, rise-time, propagation delay. n-type metal–oxide–semiconductor (NMOS)-based and complementary metal–oxide–semiconductor (CMOS)-based logic gates: inverters, Not-AND (NAND), and Not-OR (NOR) gates. Static and dynamic memory circuits. Bipolar junction transistor- (BJT-) based logic gates: Emitter-coupled logic (ECL) and transistor-transistor logic (TTL). Digital-to-analog (D/A) converters. Experiments on diode- and NMOS-based logic gates, timer circuits, and TTL.
EE 399 Summer Practice I	Minimum 20 working days of practical work in an organization operating on the design, production, maintenance, and management of electrical or electronics systems.
EE 499 Summer Practice II	Minimum 20 working days of practical work in an organization operating on the design, production, maintenance, and management of electrical or electronics systems.
EE 491 Senior Project I	Design, implementation, and integration of a comprehensive electrical and electronics engineering system. Identification of needs and constraints for the design problem. Investigation of possible solutions to the design problem. Identification of preliminary design choices and parameters. Performing a preliminary design for the design problem. Determination of preliminary design parameters. Preparation of a detailed report documenting the preliminary design. Technical communication and teamwork skills.
EE 492 Senior Project II	Development of a software or hardware prototype given a preliminary design. Examination and testing of the design choices and parameters using the prototype. Investigation of the impact of different design choices and parameters. Iterative updates of the design choices and parameters; making observations and interpretations at each iteration. Final design decision resulting from iterations. Preparation of a detailed report documenting the entire project. Technical communication and teamwork skills.
SENG 491 Senior Project I	A project proposal, literature review, requirement analysis and design.
SENG 492 Senior Project II	Project implementation. Testing document. Quality processes (verification and validation).
CMPE 491 Senior Project I	Formulation, analysis, and design of solutions to open-ended engineering problems. Detailed technical report on problem specification and design. Technical communication and teamwork skills. Awareness of ethical and professional responsibilities and constraints in engineering.
CMPE 492 Senior Project II	Formulation, analysis, design, and implementation of solutions to open-ended engineering problems. Performance evaluation. Detailed technical report on design, implementation, and performance analysis. Technical communication and teamwork skills. Awareness of ethical and professional responsibilities and constraints in engineering.
CMPE 499 Summer Practice II	A 20-day summer internship at a computer firm or IT department, focusing on advanced project development, problem-solving, and collaboration. Design and implementation of complex systems and software solutions. Presentation of experiences and developed projects.
CE 232 Fluid Mechanics	Fundamental principles of fluid mechanics and their application to engineering problems. Fluid statics. Fluid flow concepts. Control-volume analysis. Conservation equations and applications. Dimensional analysis and similitude. Flow of viscous fluids, simple laminar flow systems, turbulence, internal and external flow applications.

CE 399 Summer Practice I	Minimum 20 working days of practical work at the construction site of an organization operating on the design, production, maintenance, management of civil engineering structures and systems.
CE 499 Summer Practice II	Minimum 20 working days of practical work in an organization operating on the design of civil engineering structures.
CE 410 Civil Engineering Design	Design and development of a project for a civil engineering problem under the supervision of an academic advisor. Submission of the results in the form of a project report and oral presentation.
CE 451 Construction Engineering and Management	Introduction to construction management; parties and their roles, stages, attributes and goals of construction projects; quantity measurement calculations; construction machinery, selection criteria, hourly cost determination and output analysis; professional responsibility; health and safety issues.
BA 110 Introduction to Business	Analysis of the business environment. Main functional areas of business: management, production, marketing, finance, and accounting. The interrelationship and integrated nature of different business functions.
BA 402 Graduation Paper and Seminar	Presenting with impact. Effective communication in theory and practice. Problem solving. Emotional intelligence in theory and practice. Management with resilience. Theory vs practice in decision making. Personal development in business life.
PECE 591 Pre-Thesis Seminar	Determination of thesis topic. Preparatory work for thesis such as literature review, research question formulation, hypothesis generation, and research design. Oral presentation of thesis proposal.
PECE 592 Master's Thesis I	The first semester of the Master's thesis, performed with supervision of thesis advisor. This course must be taken in the semester in which the thesis work commences.
PECE 593 Master's Thesis II	Research project in the area of specialization. Application of scientific research processes. Report. Presentation of the results.
PECE 502 Early Childhood Learning Theories	Basic principles and concepts of learning; Learning theories and approaches (behavioral learning theories, cognitive theories, social learning theory); Feedback, motivation, and reinforcement in early childhood.
PECE 504 Assessment of Early Childhood Development and Learning	Early childhood development assessment; Systematic observation and recording techniques; Ethical and legal responsibilities in developmental assessment; Fundamental decisions in the evaluation cycle; Widely used standard developmental assessment tools. Pedagogical documentation. Preparation of developmental reports, and sharing the evaluation process and results with stakeholders (parents and other professionals).
PECE 506 Learning Approaches and Models in Early Childhood	Overview of learning and teaching approaches in early childhood education; Early intervention approaches; Alternative approaches (Montessori, Reggio Emilia, Waldorf, High Scope, Bank Street, Freinet, GEMS, Head Start, PYP, Jeneplan, Portage, Kamii / DeVries, Pyramid, Forest Schools, Creative Teaching Program etc.); Different early childhood models in the World, and feasibility of these models in Türkiye; Comparison of early childhood approaches.
PECE 507 Comparative Early Childhood Education	Historical processes of early childhood education in different countries; Principles of early childhood education; Management and financing; Curriculum models; Institution and program types; Teacher training policies; Pre-service and in-service training; Teaching methods and techniques; Evaluation processes; Family involvement policies; Special education practices; Different pedagogical approaches.
PECE 511 School, Family and Society Partnership in Early Childhood	Analysis of current research in family involvement; Engaging family and society in children's education; Supporting and reinforcing school activities around family and society partnership.
PECE 513 Emergent Literacy	Language acquisition; Development of literacy skills; Literacy education and comprehensive interventions; Evaluation of literacy performance; Implications of literacy education in early childhood education.
PECE 515 Information and Communication Technologies in Early Childhood	Child in the information age; Research and applications on Information and Communication Technologies (ICT) in early childhood education; Integration of ICT into the early childhood program; Possible effects of ICT on young children; Evaluation of ICT resources for children.
PECE 520 Education of Gifted Children	Cognitive, language, social-emotional and motor development of gifted children. Identification of gifted children. Over excitabilities and asynchronous development of gifted children. Parent education of gifted children. Strategies and education methods for gifted children.
PECE 521 Learning Environments in Early Childhood	Recognize appropriate Early Childhood Education (ECE) settings that encourage child-centered learning; Design appropriate learning environments for children; Associate learning process with the learning environment.
PECE 522 Classroom Management in Early Childhood	Basic concepts of classroom management, classroom rules, models for classroom discipline and management; The process of communication and interaction in the classroom; Characteristics of the teacher as a classroom leader; The management of teacher-parent meetings; The creation of a positive classroom and learning climate.

PECE 523 Child Psychology	The basic concepts and history of child psychology; Development areas and characteristics of infancy and first childhood periods; The family-child and school-child structures; Adjustment and behavior problems in early childhood. Classroom based prevention and intervention strategies
PECE 524 Reflective Practices in Preschool Education	The importance of reflection in preschool education; Features of reflective applications; Application of reflective practice in early childhood context; Self-reflection and peer reflection; Systematic reflection; Data-based reflection application examples; Dialogic reflection; Situation-based reflective practices in preschool education; Reflection applications on micro-teaching experiences; Promoting reflective thinking through action research.
PECE 527 Professional Development for Early Childhood Teachers	Improvements in the knowledge, skills, practices, and dispositions of early childhood professionals; Research-based training that will improve early childhood pedagogy; Integrate professional development strategies into teaching and learning process.
PECE 528 Current Research and Trends in Outdoor Education	Basic principles and fundamentals of teaching in a variety of outdoor settings (museum, monument, forest, seashore, etc.); theories applicable to outdoor education (such as place attachment theory and affordance theory); nature-based pedagogies; sustainable development in early childhood education; risk assessment in outdoor education; current outdoor education research.
ID 201 Industrial Design I	Introduction to formal, structural and functional components of design. Efficiency in manufacture and use of resources. Workshop-scale manufacturing methods. Basics of human-product interaction.
ID 202 Industrial Design II	Formal, structural and functional components of design. Product language and brand identity as a part of formgiving. Research for design. Building blocks of human-product interaction. Knowledge and skills in user-centered design process. Design as communication.
ID 341 History and Theory of Design II	Introduction to theoretical and methodological frameworks in the field of design; Contemporary and historical issues in design discourse; Design rhetorics; Design activism & design hacking; Design anthropology; Eco-design, upcycling and environmental ethics; Experience-driven design; Design thinking, creativity and innovation; Bio-design; Anti-design; Critical and speculative design.
ECON 309 Matching Theory and Market Design	Terminology in matching theory. Formulation of various matching markets. Concepts of stability, efficiency, and strategy-proofness. Foundational mechanisms including the Deferred Acceptance Algorithm and Top Trading Cycles. Applications in labor markets, school admissions, organ donations.
PSY 402 Graduation Project and Seminar	Independent research. Proficiency in a strand of literature chosen by the student in collaboration with an advisor. Analytical research paper. Written and oral presentation.
VCODE 321 Digital Culture	The characteristics of digital culture through theories; impact of technology on art, design, and social transformation; differences between verbal, digital, and written culture and their narratives.
VCODE 451 Essay Video	Essay form; characteristics and differences of essay film and essay video; audio components in essay video; editing techniques in essay video; essay video project development.
ED 430 Artificial Intelligence in Education	Introduction to the fundamentals of artificial intelligence (AI); Historical development of AI; Ethical considerations in AI including privacy and bias; AI Literacy Framework; AI's transformative impact on educational practices and its role in fostering personalized learning experiences; Risks and opportunities; Introduction to applications/tools of AI for education; Prompting in Gen AI; AI-integrated lesson plan/program design.
ED 440 Mind and Intelligence Games	Fundamental concepts of mind and intelligence games; history of mind and intelligence games, game design principles and elements; types of mind and intelligence games; utilizing generative artificial intelligence and digital tools for mind and intelligence games; development of mind and intelligence games; assessment of mind and intelligence games.
ED 450 STEM Education in Schools	Fundamental concepts of STEM education; nature and philosophy of STEM education; theory and practice in STEM education; inquiry-based learning, engineering design practices, and modeling; connections between STEM education and sustainable development goals (SDGs), cultural diversity, and inclusion; use of technology and generative artificial intelligence (AI) to enhance STEM learning experiences; design and implementation of STEM lesson plans and activities; assessment and evaluation of the strategies in STEM education to improve educational outcomes.

ED 460 Curriculum in International Contexts	Rationale for international education; fundamental elements of international school education and curricula; key components of the international programs such as Cambridge, International Baccalaureate (IB), International General Certificate of Secondary Education (IGCSE), Oxford (AQA), and A-Level; practical examples of the planning, teaching, and assessment of these programs; and the role of critical thinking and theory of knowledge in these programs.
PRED 490 Character and Values Education	The context of character and value education, educational philosophies, individual and social foundations, approaches and their reflections on the curriculum. The relationship between character education and citizenship, intercultural differences. The culture of living together, the role of teacher, family, environment, and school. Value conflicts in modern societies. Values education in the process of human-cultural development. Values education practices in Turkey and around the world.
PECE 401 Teaching Practice 1	Observations related to special teaching methods and techniques peculiar to early childhood education. Student teaching experience with children aged between zero and six in different early childhood education programs. Teach practices by using teaching methods and techniques peculiar to early childhood. Design developmentally appropriate activities and materials peculiar to early childhood. Organize learning environments. Use effective classroom management skills. Assessment of learning and development. Provision of parent involvement. Participation in professional development activities. Engage in reflection.
PECE 402 Teaching Practice 2	Independent student teaching experience with children aged between zero and six in different early childhood education programs. A daily schedule of an early childhood curriculum. Monthly plan of an early childhood curriculum. Teach practices by using teaching methods and techniques peculiar to early childhood. Design developmentally appropriate activities and materials peculiar to early childhood. Organize learning environments. Use effective classroom management skills. Assessment of learning and development. Developing adaptation activity. Provision of parent involvement and parenting styles. Participation in professional development activities.
VIP 300 Vertically Integrated Project II	Vertically integrated research, experiential learning, addressing real-world challenges, and professional development within an interdisciplinary research team.
BA 447 Perception Management	The history of perception management; mind control, subliminal messages and depths of perception; perception theories and basic principles of perception management; reputation and corporate image; advertising campaigns and perception management; industrial media and social media in perception management; new trends and developments in perception management.
ADA 466 Applied Time Series Analysis	Autoregressive and moving average (ARMA) models, Estimation of trends and seasonal effects, Box-Jenkins methodology, unit-root, ARCH - GARCH models. Application of classical machine learning models to time series data. Anomaly analysis.
SENG 472 Large Language Models (LLM) Powered Software	Introduction to Large Language Models (LLM). LLMs for AI-Powered Applications. The copilot system, frameworks. Choosing an LLM for Application. Closed & Open Models, Prompt Engineering. Embedding LLMs within Applications. Building Conversational Applications. Developing the front-end.
EE 517 Deep Learning for Engineers	Supervised and unsupervised machine learning, Stochastic gradient descent and other optimization techniques, Cost functions, Backpropagation algorithm, Classification and regression problems, Convolutional neural networks, Autoencoders, Reinforcement learning, Application of machine learning in various fields of engineering
ARCH 451 Fundamentals of Cultural Heritage Conservation	Introduction to the principles of conservation of cultural heritage. Examples of conservation implementations both national and international. Problems and developments in the field of conservation in the world and Turkey.
ARCH 445 Research on Architectural Tectonics	Practical modes of research through making and construction. Action research in architecture. Architectural tectonics. Constructional aspects of design problems. Materials, techniques and holistic detailing of interior and exterior spaces.
ID 111 Visual Communication Techniques I	Visualization and graphic representation techniques in different media. Conventions and universal standards of technical drawing, orthographic projection, isometric drawing, free-hand sketching. Introduction to digital graphic presentation.
ID 112 Visual Communication Techniques II	Visualization and graphic representation techniques in different media. Expression and communication of design ideas, design elements and formal attributes. Free-hand sketching, Perspective drawing, Introduction to three-dimensional modelling techniques, Product presentation with digital media.
ARCH 443 Acoustics and Lighting Design	Principle design methods and applications of acoustics and lighting design in buildings. Introduction to subjects of architectural acoustics and noise control. Fundamental daylighting and artificial lighting design principles, detailing, materials and systems.
ARCH 554 Architectures of Photographic Environment	Themes, concepts, media, and practices of architectural photography. Visuospatial and photographic discourse of architecture. Studies on form and light. Photographic composition. Production of photographic work concerning the built environment and architecture's impact on daily life.

PECE 501 Early Childhood Learning Theories	Basic principles and concepts of learning; Learning theories and approaches (behavioral learning theories, cognitive theories, social learning theory); Feedback, motivation, and reinforcement in early childhood.
SENG 261 Digital Design and Computer Architecture	Introduction to digital design, including number systems, Boolean Algebra, and logic gates. Design and optimization of combinational and sequential circuits. Fundamentals of computer organization, focusing on MIPS architecture, instruction sets, and registers. Branching, loops, procedure calls, addressing modes, and memory management.
EE 462 Power System Analysis	Structure and characteristics of electrical power systems. Smart grids. Renewable energy sources. Electrical modeling of transmission lines, transformers and generators. Representation of power systems. Bus admittance and bus impedance matrices. Load flow analysis. Symmetrical three-phase fault analysis.
EE 464 Power System Protection	Sources and types of faults. Symmetrical components and sequence networks. Analysis of three-phase and unbalanced faults. Instrument transformers. System grounding principles. Overcurrent protection. Transformer, generator and motor protection. Line-cable protection. Busbar and breaker failure protection.
SOC 224 Social Anthropology	Anthropology, its subfields and its relevance; Anthropological Ways of seeing; Anthropological Ways of Doing; Unit of Analysis: Culture and Society; Culture and Language; Religion and Rituals; Kinship as Descent, Kinship as Marriage; Stratification in Terms of Class, Caste, Gender, Age; Subsistence Patterns and Economic Systems; Political Anthropology: Bands, Tribes, Chiefdoms and States; Globalization and Cultural Change
ADA 430 DeepTech Entrepreneurship	Introduction to DeepTech and Entrepreneurship, Identifying DeepTech Opportunities, Innovation and Research in DeepTech, Market Analysis and Validation, Business Model Development, Prototyping and Product Development, Funding DeepTech Startups, Regulatory and Ethical Considerations, Scaling DeepTech Ventures, Marketing and Sales for DeepTech, Case Studies in DeepTech Entrepreneurship, Preparing for Exit: IPOs and Acquisitions
PSCG 401 Practicum in School Counseling 1	Investigation of educational, vocational and personal / social guidance and psychological counseling activities in preschool, primary, secondary and high schools, application and interpretation of test and non-test techniques; Development and implementation of group guidance programs on various topics.
PSCG 409 - Practicum in Individual Counseling 1	Counseling by using counseling skills and techniques under supervision.
EMBA 511 Foundations of Business Management	Functions of management; basic concepts and principles of management; managerial analysis and decision-making; internal and external environment analysis; managerial competence; organizational structure.
EMBA 513 Financial Reporting and Quantitative Methods	Basic principles and assumptions used to account for financial information; recording business transactions; reporting standards; preparation of financial statements based on International Financial Reporting Standards (IFRS); main differences between tax accounting and IFRS; financial statement analysis; principles of taxation and tax audits; fundamentals of statistics; model construction, optimization, and simulation techniques; role of forecasting in organizations.
EMBA 522 Foundations of Marketing Management	Customer value proposition. Satisfaction and loyalty. Marketing insights. Developing and managing brand. Designing, developing and managing market offerings. Communicating value. Delivering value. Managing marketing metrics.
EMBA 515 Operations and Process Management	The link between financial and operational performance; the challenges in matching supply and demand; process flows, capacity, throughput, utilization and bottleneck; managing supply chains; business model innovation; basic pricing and revenue management concepts; segmentation and pricing under capacity constraints; project time management; project cost management; project risk management; product costing; cost behavior analysis; planning and budgeting.
EMBA 517 Data-Driven Management	Data-driven decision making; problem identification; understanding and analyzing data; alternative assessment; decision-making and communication; big data analytics; artificial intelligence; data visualization; machine learning applications; data governance, ethics, and privacy.
EMBA 526 Effective Decision-making and Risk Management	The scientific approach to decision making; strategic decision-making biases and traps; group vs. individual decision-making; financial risk management; derivatives markets; hedging strategies using futures, forwards, swaps and options; major categories of supply chain disruptions; supply chain risk management; strategies to manage supply chain risks.
EE 402 Linear Control Systems	Modeling systems. Causality. Time-invariance. Linearity. Matrix functions. Jordan form. Singular value decomposition (SVD). Positive definiteness. Solution of state equations. Stability.
SENG 483 Secure Software Engineering	Software vulnerability fundamentals. Concepts for developing secure code. Software design fundamentals refresher. Memory, language, file system coding issues. Top secure coding standards for software systems. Secure coding practices. Defensive coding. Analysis of software for security. Techniques for adding security to deployed software systems. Mobile device and applications security.

SENG 484 Ethical Hacking and Countermeasures	Introduction to the principles for penetration testing or ethical hacking. Ethics of hacking and cracking. Reconnaissance. Scanning tools. Pentesting tools. Sniffers. TCP/IP Vulnerabilities. Encryption and password cracking. Spoofing. Session hijacking. Hacking network devices. Trojan horses. Denial-of-Service attacks. Buffer overflows. Programming exploits. Mail vulnerabilities. Web application vulnerabilities. Windows exploits and vulnerabilities. Linux, Mac exploits and vulnerabilities. Open-source tools used in ethical hacking and penetration testing. Commercial alternatives to open-source tools. Physical attacks and defenses. Honeynets/honeypots. New hacker tools and platforms.
ENGR 490 Contemporary Issues in Engineering	Seminars on engineering topics such as, ethics, life-long education, engineering standards, project management, risk management, change management, entrepreneurship and innovation, sustainable development, effects of engineering applications on health, environment and safety, legal consequences of engineering solutions. A multidisciplinary group work on a selected theme.
CMPE 491-O Senior Project I	Project proposal. Literature review. Requirement analysis. Design.
ME 554 Introduction to Aerothermodynamics	Inviscid hypersonic flow theory. Introduction to viscous hypersonic flow, aerothermodynamic heating, the fundamentals of heat transfer and the design of thermal protection systems. High temperature, chemically reacting gas.
SOC 324 Sociology of Crime and Deviance	Definitions of Concepts; Epistemology of Studying Crime and Deviance: Qualitative and Quantitative Methods; Ethics of Studying Crime and Deviance; Theories on Deviance; Classical, Modern and Critical Theories on Crime; Institutional Responses; Societal Responses; Victimology and Forms of Crime: Crime Against Women and By Women; Crime Against Children and by Children; Crime Against Sexual Minorities and Hate Crimes; Organized Crime; White Collar Crime; Cyber Crime; Non-Criminal Deviance; Crime in Turkey.
ECON 376 Economics of Artificial Intelligence	Artificial intelligence, social media, digital technologies, platform economies, big data.
PSIR 454 Politics of Imagined Futures	Conceptualizations of utopia and dystopia; the origins of utopian and dystopian thought in politics; historical trends in political utopias and dystopias in western canon; late 19th century political utopias and dystopias; socialist utopias; post-human utopias; utopias and dystopias in Turkish socio-political thought.