EGR 111. Introduction to Engineering Thinking and Practice. (4 h)
Introduction to the study and practice of engineering, systems thinking, design, research, creative and analytical problem solving practices, and engineering for humanity. With laboratory.

EGR 112. Introduction to Engineering Measurement and Analysis. (4 h)
Exploration of tools, processes, and quantitative and qualitative analysis for modern engineering practice. With laboratory.

EGR 113. Integrated Sciences. (4 h)
An integrated basic science course covering topics in the biological, chemical, and physical sciences. With laboratory.

EGR 211. Materials and Mechanics. (4 h)

EGR 212. Transport Phenomena. (4 h)

EGR 281. Introductory Projects with Engineering. (1-4 h)
Specialized and focused learning via experiential projects. May be repeated for credit.

EGR 301. Special Topics in Engineering. (1-4 h)
Seminar and/or lecture and/or project-based and/or laboratory courses in selected topics. May be repeated if the course title changes.

EGR 311. Control Systems and Instrumentation. (4 h)
Fundamentals of circuits and semiconductor electronics as applied to the analysis and design of engineering instrumentation and control systems. With laboratory. P-EGR 211, 212, MST 113, 205.

EGR 312. Computational Modeling in Engineering. (4 h)
Computational problem solving tools (programming, systems modeling, numerical methods), with consideration of the economic and ethical outcomes of decisions that are made using such techniques. With laboratory. P-EGR 211, 212, MST 113, 205. (STA 111 highly encouraged but not required).

EGR 313. Capstone Design I. (1 h)
The first course of the capstone design experience. C-EGR 311, 312.

EGR 314. Capstone Design II. (4 h)
The second course of the capstone design experience. P-EGR 313.

EGR 315. Capstone Design III. (4 h)
The third course of the capstone design experience. P-EGR 314.

EGR 316. Chemical Reaction Engineering. (2 h)
Rates of homogeneous, catalytic, and biological reactions; reactor design and analysis, and related flow diagrams. With laboratory. P-EGR 212, MST 205, CHM 122, 280.

EGR 317. Hydrologic and Hydraulic Engineering. (2 h)
Fundamentals of open channel hydraulics, hydrologic analysis and modeling at the watershed scale, hydraulic design of pressurized systems, groundwater hydraulics, and urban hydraulic system design. With laboratory. P-EGR 212.
EGR 329. **Functional Advanced Materials Characterization.** (2 h)
Relationships between atomic structure, microstructure, and observable properties of functional and advanced materials. Measurement and modification of material properties. With laboratory. P-EGR 211, MST 113, CHM 111 and 111L.

EGR 330. **Infrastructure Systems Design.** (2 h)
Explore principles of infrastructure systems through experiential learning and application of concepts to design or redesign a local system with consideration of technical, social, environmental, and economic factors. With laboratory. P-EGR 211 and 212.

EGR 331. **Thermal Fluid Systems.** (2 h)
Applying fundamentals of fluid mechanics, heat transfer, and thermodynamics across diverse engineering applications in the analysis and design of thermal fluid systems. With laboratory. P-EGR 212 and MST 205.

EGR 332. **Structural Engineering I.** (2 h)
Applying engineering mechanics fundamental in the analysis of varying structures, including bridges and buildings. Understanding the use of structural materials such as masonry, wood, steel, and concrete as applied to real-world contexts. With laboratory. P-EGR 211.

EGR 333. **Tissue Engineering.** (2 h)
Fundamentals of biomaterials, stem cells, and imaging technologies to analyze novel tissue engineering applications. With laboratory. P-EGR 211, 212, BIO 111 or 114, CHM 111 and 111L or POI.

EGR 334. **Mobile Robotics.** (2 h)
Introduction to mobile robotics, from hardware (energy, locomotion, sensors) and software (signal processing, control, localization, trajectory planning, high-level control). With laboratory. P-EGR 211, 212 and 311.

EGR 381. **Research.** (1-4 h)
Research project conducted individually under guidance of a research mentor. May be repeated for credit.