GSE 0902. Robotics: Fundamentals. 6.8 Hours.
Introduces teachers of grades 6–12 to the principles of engineering design and to the foundations of engineering on applied sciences and mathematics. Outlines the design process, examines input factors, and uses case studies for implementation. Stresses the importance of solid scientific foundations as well as creativity, optimization, safety, ethics, aesthetics, reliability, durability, serviceability, cost, and market acceptability. The engineering design steps include the development and use of design methodologies, formulation of design problem statements and specifications, consideration of alternative solutions, feasibility considerations, and detailed system descriptions. This hands-on course is aligned with the Massachusetts Science and Technology/Engineering Framework.

GSE 0903. Robotics: Engineering Technology in Practice . 6.8 Hours.
Offers students an opportunity to complete a practical implementation working with middle school students from the local school district who design and build robotic devices. The course provides an enrichment opportunity for children in a laboratory environment involving participating teachers who practice concepts and techniques learned in GSE 0902.

GSE 0904. Robotics: Engineering Technology in Practice . 8.7 Hours.
Offers participants an opportunity to complete a practical implementation working with middle school students from the local school district who design and build robotic devices. Provides an enrichment opportunity for children in a laboratory environment involving participating teachers, who practice concepts and techniques learned in the associated course.

GSE 5976. Directed Study. 1-4 Hours.
Offers independent work under the direction of members of the department on a chosen topic.

GSE 5978. Independent Study. 1-4 Hours.
Offers independent work under the direction of members of the department on a chosen topic.

GSE 5984. Research. 1-4 Hours.
Offers students an opportunity to conduct research under faculty supervision.

GSE 6501. From Science to Engineering: Preengineering Design. 4 Hours.
Introduces teachers of grades 6–12 to the principles of engineering design and to the foundations of engineering on applied sciences and mathematics. The design process is outlined, input factors are examined, and implementation takes place with case studies. Stresses the importance of solid scientific foundations as well as creativity, optimization, safety, ethics, aesthetics, reliability, durability, serviceability, cost, and market acceptability. The engineering design steps include the development and use of design methodologies, formulation of design problem statements and specifications, consideration of alternative solutions, feasibility considerations, and detailed system descriptions. This is a hands-on course, aligned with the Massachusetts Science and Technology/Engineering Framework.

GSE 6502. Robotics: Fundamentals. 4 Hours.
Provides training for middle school teachers integrating an innovative robotics curriculum with concepts in engineering and technology. The engineering and technology concepts are derived from components of the Massachusetts Science and Technology/Engineering Curriculum Frameworks. Offers participants an opportunity to learn to identify a problem, design a robotic solution, and program and test their design during the course in preparation of delivering the concepts to students.

GSE 6503. Robotics: Engineering Technology in Practice . 4 Hours.
Offers students an opportunity to complete a practical implementation working with middle school students from the local school district who design and build robotic devices. The course provides an enrichment opportunity for children in a laboratory environment involving participating teachers who practice concepts and techniques learned in GSE 6502.

GSE 6961. Internship. 1-4 Hours.
Provides students with an opportunity for internship work. May be repeated without limit.

GSE 6962. Elective. 1-4 Hours.
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

GSE 6964. Co-op. 0 Hours.
Provides eligible students with an opportunity for work experience.

GSE 6966. Practicum. 1-4 Hours.
Provides eligible students with an opportunity for practical experience.

GSE 6970. Seminar. 1-4 Hours.
Offers an in-depth study of selected topics.

GSE 6980. Capstone. 1-4 Hours.
Offers students an opportunity to integrate their course work, knowledge, and experiences into a capstone project.

GSE 6983. Topics. 1-4 Hours.
Covers special topics in graduate engineering. May be repeated without limit.

GSE 6995. Project. 1-4 Hours.
Focuses on in-depth project in which a student conducts research or produces a product related to the student’s major field. May be repeated without limit.