SYSTEMS ENGINEERING CONCENTRATION

Systems Engineering is an interdisciplinary approach and means to enable the realization of successful systems. It focuses on defining customer needs and required functionality early in the development cycle, documenting requirements, proceeding with design synthesis and system validation while considering the complete problem that includes – operations, cost & schedule, performance, training & support, test, disposal, and manufacturing. Systems Engineering integrates all the disciplines and specialty groups into a team effort forming a structured development process that proceeds from concept to production to operation. Systems Engineering considers both the business and the technical needs of all customers with the goal of providing a quality product that meets the user needs. In addition, Systems Engineering incorporates concepts of “balanced design” – achieving a product design that meets requirements but does not exceed them, and does so within the constraints of cost, schedule & performance, including life cycle costs; and “risk assessment & management” – understanding the technical and other risks that may be involved and managing the design to effectively mitigate the risks.

Required courses (5 courses, 13 credits)
- ECE.09.421 Topics in ECE: Introduction to Systems Engineering – 3-credits
- MKT.09.375 Business Logistics – 3-credits
- CS.06.390 Introduction to Systems Simulation and Modeling – 3-credits

Plus, any two of the following –

- ENGR.01.301 Junior Engineering Clinic I – 2-credits
- ENGR.01.302 Junior Engineering Clinic II – 2-credits
- ENGR.01.401 Senior Engineering Clinic I – 2-credits
- ENGR.01.402 Senior Engineering Clinic II – 2-credits

TOTAL Required course credits – 13-credits

Elective courses (take any 2)
- ECE.09.321 Systems & Control – 3-credits
- ECE.09.331 Electrical Communications Systems – 4-credits
- ECE.09.402 Topics in ECE: Technology Focus Elective – 3-credits
- CS.07.340 Design and Analysis of Algorithms
- CS.07.321 Software Engineering I
- CS.04.380 Object Oriented Design
- ME.10.342: Quality & Reliability in Design and Manufacture
- ME.10.343: Mechanical System Dynamics and Control
- CE.08.305: Civil Engineering Systems
- CHE.06.405: Process Dynamics and Control
- EM.01.511: Strategic Risk Management
- EM.01.512: Quality in Engineering Management
- EM.01.513: Engineering Decision Making
- MGT.06.677 Management Skills for Engineers
  (Additional elective courses will be added to the concentration)

TOTAL Elective course credits – 6-7-credits

TOTAL credits in the Systems Engineering Concentration – 19-20-credits