Program Requirements

The Reliability Minor requires completion of 18 credits of which at least 12 must be in addition to the credits applied to the major.

Required Courses (9 credit hours)

IME 460 – Evaluation of Engineering Data: Design of engineering experiments and evaluations, curve fitting, regression, hypothesis testing, ANOVA, Taguchi methods in engineering design. (3 Credits) Coreq: MATH 166.

IME 463 Reliability Engineering: Study and application of statistical models and methods for defining, measuring and evaluating reliability of products, processes and services: life distributions, reliability functions, reliability configurations, reliability estimation, parametric reliability models, accelerate life testing, reliability improvement. (3 Credits) Prereq: IME 460.

IME 464 Reliability Analysis: System modeling and analysis, designing for reliability, reliability testing, reliability in manufacturing, and reliability management, fault tree analysis, RBD, and cut sets are covered along with sneak circuits, time-on-test plots and acceptance testing. (3 credits) Prereq: IME 463

Elective Courses (9 credit hours)

IME 450. Systems Engineering and Management. Integration of technical disciplines through the stages of systems life cycle: needs and requirements determination, operating and support concepts, design and prototyping, test and evaluation, facilitation, manuals, training, and supportability. (3 Credits) Prereq: Junior standing.

IME 461. Quality Assurance and Control. Proactive and reactive quality assurance and control techniques; emphasis on quality planning, statistical process control, acceptance sampling, and total quality management. Issues in reliability and maintainability engineering. (3-4 Credits) Prereq: IME 460.

ME 332 Engineering Materials II: Characterization of properties and processes in metals; diffusion, phase diagrams, phase transformation, creep, wear, corrosion, fracture, and fatigue. (3 Credits) Prereq. ME 331

ME 442 Machine Design I. Application of engineering mechanics, material properties, and failure theories to the design of reliable machine components. (3 Credits) Prereq. ME 331

ME 472 Fatigue and Fracture of Metals: Causes and effects of fatigue failure and fracture of metals, analytical methods for fatigue design and fatigue life prediction, fatigue crack initiation and propagation, fatigue testing and validation. (3 Credits) Prereq. ME 442
ECE 341 Random Processes. Principles of probability. Application of probability and statistics to electrical and computer engineering problems. (3 Credits)

ECE/IME 427 Packaging for Electronics. Processes and materials for packaging of electronic components and devices, including integrated circuit chips, chip packages, and board level packaged systems; boards and substrates technology; quality and reliability of electronic packages. Open to all engineering majors. (3 Credits) Prereq. Jr. Standing

ECE 443 Communications I. Communications theory and design with an emphasis on spectral techniques. Modulation and noise effects. (4 Credits) Prereq. ECE 341 and ECE 343.

ECE 444 Applied Digital Signal Processing. Digital signal processing theory balanced with practical application. Includes design of FIR, IIR, and adaptive filters; Fast Fourier Transforms; sampling theory; implementation techniques; multi-rate processing. Emphasizes system implementation using development tools and DSP hardware. (3 Credits) Prereq. ECE 173, ECE 343.

STAT 461 Applied Regression Models. Simple linear regression, matrix approach to multiple regression, and introduction to various tests and confidence intervals. Includes discussion of multicollinearity and transformations. (3 Credits) Prereq: STAT 330 or STAT 368.

STAT 462 Introduction to Experimental Design. Fundamental principles of designing an experiment, randomized block, Latin square, and factorial. Also covers analysis of covariance and response surface methodology. (3 Credits). Prereq: STAT 330 or STAT 368.