

Master of Engineering in Systems Engineering

Year 1, Semester 1

Title	Description	Credits
Engineering Analysis I	The course includes applications of advanced engineering mathematics; the study of systems is described by ordinary/partial differential equations and methods of solutions.	3 credits Term 1
Creativity and Problem Solving I	Foundations of individual problem solving including creativity, cognitive style and level, problem solving processes and techniques, the paradox of structure.	3 credits Term 2

Year 1, Semester 2

Title	Description	Credits
Technical Project Management	Analysis and construction of project plans for the development of complex engineering products taken from a variety of problem domains.	3 credits Term 1
Probability Models and Simulation	Provides background in modeling problems containing random components that must be accounted for in a reasonable solution.	3 credits Term 2

Year 1, Semester 3

Title	Description	Credits
Systems Verification Validation and Testing	The theory and practice of verification, validation and testing of engineering systems.	3 credits Term 1
Deterministic Models and Simulation	Provides a background in simulation and the modeling of problems that contain differential equations as part of the system.	3 credits Term 2

Year 2, Semester 1

Title	Description	Credits
Systems Optimization	Theory/practice of linear programming will be developed including determination of optimum mix of products, levels of staffing, blending, network analysis, multi-period planning.	3 credits Term 1
Decision and Risk Analysis in Engineering	Analysis of engineering decisions under uncertainty; problem identification, formulation, judgment, resolution; mitigation, risk analysis, quantification, and management.	3 credits Term 2

Year 2, Semester 2

Title	Description	Credits
Systems Engineering	Fundamentals of systems engineering with focus on System methodology, design, and management; includes life cycle analysis, human factors, maintainability, serviceability/reliability.	3 credits Term 1
Requirements Engineering	Theory and applications of requirements elicitation, analysis, modeling, validation, testing, and writing for hardware and software systems.	3 credits Term 2

Year 2, Semester 3

Title	Description	Credits
Software Architecture	Software systems architecture; architectural design principles/patterns; documentation/evaluation of software architectures; reuse of architectural assets through frameworks/software product lines.	3 credits Term 1
Master's Paper Research	Supervised student activities on research projects identified on an individual or small-group basis.	3 credits Term 1