Description of the Courses in the UCF Master of Science in Engineering Management (MSEM) – Professional Offering

Course	Overall Objectives	Specific Objectives
EIN 6326 Technology Strategy	Increase the student's ability to start a project with the business need at the forefront of the planning process.	• Defining the core challenges of a project-based organization. • Understanding how to formulate to connect a project to the organization's strategic and portfolio plans. • Defining a business model of the organizational system. • Using a systematic decision making & critical thinking process.
EIN 6370 Innovation in Engineering Design	Increase the student's ability to design a user-centered product/service system by developing creative ideas and prototypes.	• Understanding the product design process. • Understanding the different tools available to understand customer requirements. • Understanding the creative brainstorming process. • Understanding the prototype development process.
ESI 5219 Engineering Statistics	Increase the student's ability to use data and statistics to make sound, informed business decisions.	• Collecting and summarizing data. • Understanding the concept of variation—special and common cause of variation. • Understanding the overall statistical analysis process. • Understanding the process to select the appropriate analysis approach—understand "when to" and "when not to" use an analysis technique. • Understanding the role of business analytics in corporate performance. • Defining the business analytics process. • Understanding the typical statistical analysis tools associated with Lean/Six Sigma.
ESI 6358 Decision Analysis	Increase the student's ability to make rational decisions while evaluating trade space options (i.e., make decisions within the trade study process).	• Using analytical tools to make decisions. • Understanding the role of analytical tools to make business decisions within a decision making process . • Understanding the overall decision analysis process. • Understanding the process to select the appropriate analysis approach—understand "when to" and "when not to" use an analysis technique. • Providing an overview of simulation and modeling, decision trees, and value focused thinking as tools for making decisions.
ESI 6551 Systems Engineering	Increase the student's ability to define a product to meet requirements.	• Defining the systems engineering process. • Understanding and applying the systems engineering process. • Understanding how to define requirements. • Understanding how to allocate, manage, and verify requirements. • Understanding configuration control. • Understanding the role of the "ilities". • Understanding the technical risk management process and tools.

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ESI 6552 Systems Architecture	Increase the student's ability to design and structure complex networks or systems.	• Interfacing with the user(s) and sponsor(s) and all other stakeholders in order to determine their (evolving) needs. • Generating the highest level of system requirements, based on the user's needs and other constraints. • Ensuring that this set of high level requirements is consistent, complete, correct, and operationally defined. • Introducing heuristics approach to the process of systems architecting in business, economic, social, urban, military, and government domains. • Understanding conceptual representation and acceptance phases.
EIN 6357 Advanced Engineering Economic Analysis	Increase the student's ability to deliver a project within cost expectations and to make decisions within the corporate financial perspective.	• Understanding the technical underpinning of engineering economic and simulation-based costing analysis. • Understanding how to read financial statements. • Understanding how project decisions impact the organization's profit equations and overall financial health. • Understand the role of life cycle costing for complex systems using top down and bottoms up methods for estimating software, hardware, integration, and management costs.
ESI 6511 Systems Integration and Testing	Increase the student's ability to integrate, test, and evaluate the system and its elements.	• Understanding how integration tests are defined and executed according to the plans developed during, and in sync with, the architectural design. • Exercising the functionalities of the components and ultimately the system as a whole according to the requirements specifications. • Ensuring that the functionalities of the whole system are tested with respect to the expectations of the final users. • Understanding integration testing strategies. • Understanding Test Automation approaches, tools, and benefits. • Understanding incremental testing and integration with Agile Design.
EIN 5140 Project Engineering	Increase the student's ability to deliver a project and have a successful project (meet commitments and expectations for a project).	• Understanding the multiple roles of a project manager as a solution provider and how these roles change over the life-cycle of a project. • Understanding how to formulate a project to gain approval. • Understanding the project management process and tools. • Understanding the "project review" process and tools.

Course	Overall Objectives	Specific Objectives
EIN 5108 The Environment of Technical Organizations	Increase the student's ability to navigate the core processes of and overcome the typical challenges of a project-based organization.	• Understanding the environment of the technical organization. • Understanding the basics of organizational behavior and they apply to scientists and engineers. • Understanding how to organize and staff the project and office team. • Understanding the leadership skills of the project manager, how to manage individuals, your time, project teams. • Understanding how to deal with conflict.
EIN 6182 Engineering Management	Increase the student's ability to strategically manage an engineering organization.	• Understanding the nature of organizational transformation. • Identifying the core processes of a project-based organization. • Evaluating the core challenges of a project-based organization. • Understanding the strategic management process of the organization. • Understanding the portfolio management process of the organization. • Understanding how to "connect the dots".
EIN 6950 Industrial and Systems Engineering Capstone Course	Apply program-learned Knowledge to actual projects.	• Providing solutions for company-specific project.