Course Name: System Integration & Architecture **Course Code:** ITEC426

General Information						
Course Code	**ITEC426**	**Level/Year**	**8th/4**	**Required (R) / Selected Elective (SE)**		**R**
Credit Hours	**Theory**	**2**	**Lab**	**1**	**Total**	**3**
Prerequisites	**ITEC322**	**Course Coordinator**		**Mr. Ahamed Ali Shaik Meeran**		
Corequisites	**-**	**Track Leader**		**Dr. Siva Malar**		

Course Description

This course is designed to provide students with an understanding of Systems Integration (SI) process, approaches, drivers, tools and techniques required for successful SI, critical success factors, and best practices. The course focuses on how a proposed system will be integrated with other existing or planned systems. It addresses the System Integration problem using architectures as the basis and then addresses the evaluation of the architectures in terms of the capabilities they provide. Case studies and examples from the Information Technology (IT), energy, and financial services industry will be used to illustrate the concepts discussed. The students will learn the theory and practice of business process integration, legacy integration, new systems integration, business-to-business integration, integration of commercial-off-the-shelf (COTS) products, interface control and management, testing, integrated program management, integrated Business Continuity Planning (BCP). Specific focus will be given to issues of interface integration and interoperability of systems.

Course Objectives : On completion of the course, the student will be able to:

- Develop the students' ability to learn, create, develop and integrate complex system architectures.
- Understand the role of system architects and relationship to systems engineering and integration.
- Apply the system architecture concepts to define an enterprise baseline.
- Create an architectural blue print for transforming the enterprise.
- Identify capability gaps as well as redundancies.
- Perform effective systems integration.

Course Contents

List of Topics	Weeks
CH 1: Systems Engineering	1,2
CH 2: The System Development Process,	3, 4, 5
CH 3: Systems Engineering Management	5, 6
CH 4: Needs, Requirement & Functional Analysis	7,8, 9
CH 5: System Architecting, Model Based Systems Engineering.	10, 11

CH6: Risk Management	12, 13
CH7: Integration and System of Systems Engineering	14,15

Textbook

- Systems Engineering Principles and Practice, Alexander Kossiakoff, Samuel J. Seymour, Third Edition, Published:2020, Publisher: Wiley & Sons Inc

Reference Materials

- Software Systems Engineering, Andrew P Sage, James D Palmer, Wiley Series
- Architecting Resilient Systems: Accident Avoidance and Survival and Recovery from disruptions, Scott Jackson, Wiley series

Course Learning Outcomes

CLO	Description	Mapped PI
CLO#01	**Identify** the activities of System Engineering Plan	PI 1.3, PI 3.3
CLO#02	**Design** the integration of the Total System.	PI 2.3
CLO#03	**Analyse** the Operational**,** Logical**,** Architectural views	PI 3.2, PI 6.1
CLO#04	**Demonstrate** the responsibilities of Program Manager in Systems Engineering.	PI 1.3, PI 2.4
CLO#05	**Explain** the functional building blocks in functional Analysis.	PI 3.1
CLO#06	**Explain** integrating the total system in Systems Integration	PI 6.2

CLO-PI-SO Mapping

	SO-1	SO-2	SO-3	SO-4	SO-5	SO-6
CLO#01	PI 1.1		PI 3.3			
CLO#02		PI 2.3				
CLO#03			PI.3.2			PI 6.1
CLO#04	PI 1.3	PI 2.4				
CLO#05			PI 3.1			
CLO#06						PI.6.2