

Course Syllabi

1. TICS-00039 SOFTWARE DESIGN AND ARCHITECTURE

2. 96 credits hours.

3. Bibliography

- Software Architecture in Practice, Len Bass, Paul Clements, Rick Kazman, 2012
- Software engineering, Sommerville, Ian, 2015
- Practical Model-Based Systems Engineering, Jose L. Fernandez, Carlos Hernandez, 2019

4. Specific Course Information

- a. Software architectures are the highest level of design in the structure of a system that includes software elements, their visible properties, and the relationships between them. This course provides students with concepts and tools to facilitate the use of architectural methodologies and proposals in the process of software development; providing knowledge and generating the skills necessary to improve the quality of applications. The fundamental content includes tools , case studies and integrative examinations.
- b. Prerequisites:
 - TICS-00061 COMPUTER NETWORKS
 - TICS-00072 SOFTWARE VERIFICATION AND VALIDATION
 - TICS-00046 REQUIREMENTS ENGINEERING
 - TICS-00064 COMPUTER SECURITY
 - TICS-00044 EMPIRICAL SOFTWARE ENGINEERING

5. Learning Objectives of the Course

- a. Design software architectures that respond to architecturally significant functional and non-functional requirements. Through the application of techniques and tools that support design decision-making.
 - Acquire a general understanding of software architectures
 - Analyze and prioritize architecturally significant requirements (RAS) established by stakeholders.
 - Identify and analyze system quality attributes
 - Execute conception activities n and software architecture design
 - Apply models of software architecture documentation
 - Use tools to design software architectures with respect to their architecturally significant requirements and prioritized quality attributes
- b. Learning Outcomes
 - Document the architecture of the applications according to the level of abstraction required by the stakeholders
 - Identify and prioritize significant architectural requirements
 - Design appropriate software architectures in one or more application domains, using software engineering methods

6. Course Topics

- Introduction
- Architecture and quality attributes
- Architecture and the life cycle
- Architectural patterns

- Services-oriented architecture