**IT561 - Advanced Software Engineering (3-0-2-4)**

**Objective:** The course focuses on tools and techniques for the development of software systems, with an emphasis on the construction and management of internet-oriented, agent-oriented and large software systems. The course is equipped with essential research, analytical and critical thinking skills.

**Contents:** The main objective of this course is to understand and learn how complexity and change are engineered during large software development. Here, we would focus on the methodologies (processes), techniques (methods), and tools that can be used to successfully design and validate large software systems.

This would also be a research-oriented course that will focus on the state of the art in applying quantitative assessment methods in Software Engineering and other related fields. The contents to be covered are: (1) Software Requirements Modeling and Specifications, (2) Software Architecture and Design Patterns, Software Development Methodologies, (3) Software Measurement and Metrics, (4) Empirical Software Engineering, (5) Computer Aided Software Engineering and Tool Support (DevOps, Automation), (6) Applications of ML and AI in analyzing software products (7) Assessment and Evaluation in Software Engineering.

**Outcomes:**
1. The students are expected to learn and practice how the large scale software systems have been developed, what are the related complexities and how to deal with them.
2. The students are expected to learn and understand software development using components.
3. The student is expected to learn and realize the evaluation, analysis, and application of existing technologies and tools in the context of a problem.

**Grading Policy:**
- Quizzes - 15%
- Lab/Assignment/Project and Viva - 25%
- In-Semester Exam - 25%
- Final Exam - 35%

**References:**

**Online Delivery of Lecture and Labs:**
The class size is not too large (21 students), hence, I have planned to use Google Meet/Zoom for taking the online lectures/labs. The earlier experience with Google Meet is satisfactory. For the lab sessions, I will use only open source tools which students can download and install in their machines. For MIS, Google classroom will be used.