TIM-8140, Software Engineering

(3 credits)

## Course Description:

In this course, students will explore emerging issues in software engineering. Emphasis will be placed on trends in mobile development, architecture and design, testing, security, and the empirical analysis of software systems.

## Course Learning Outcomes:

1. Upon completion of this course, you will be able to:
2. Manage the analysis, design, implementation, and maintenance of quality software. (L6)
3. Evaluate current trends and practices in software engineering. (L5)
4. Evaluate large software systems and repositories for the extraction of useful information. (L5)
5. Propose improvements to the theory and practice in software engineering. (L6)

## Course Concepts:

1. Software Architecture and Design
2. Software Quality Assurance
3. Software Engineering Analysis
4. Emerging Software Engineering Practices

## Primary Resource/textbook:

None

## Course Outline

### Section 1: Understand Leading Software Engineering Topics & Venues

#### Week 1: Software Engineering Venues: Introduction

##### Assignment: Conference Venue Review and Analysis (10 points)

#### Week 2: Empirically Analyze Software Systems

##### Assignment: Conduct an Empirical Analysis on an Existing Dataset (10 points)

#### Week 3: Propose and Design a Dataset for Empirical Analysis

##### Assignment: Propose an Empirical Study (10 points)

### Section 2: Understanding Current Trends in Software Engineering

#### Week 4: Mobile Engineering: Process and Issues

##### Assignment: Formulate a Mobile Engineering Problem Statement (10 points)

#### Week 5: Software Quality Assurance

##### Assignment: Examine A Quality Assurance Case Study (10 points)

#### Week 6: Software Architecture and Design

##### Assignment: Examine and Critique a Scholarly Article Related to Architectural Tactics (10 points)

### Section 3: Research and Application

#### Week 7: Research Proposal

##### Assignment: Create a Research Proposal (20 points)

#### Week 8: Experimentation

##### Assignment: Reproduce an Experiment (20 points)