National University of Computer & Emerging Sciences (FAST) – Lahore Campus

Semester: Fall 2018

Course Name: Software Engineering Technologies (CS527)

Course Outline:

1. **Course Introduction**

2. **Concepts in Software Engineering**

    a. Introduction
    b. Software Engineering
    c. Software Products
    d. Why Engineer
    e. Market challenges to Software Engineering/Products
    f. Human Computer Interaction (HCI)

3. **Software Processes & Development Lifecycles**

    a. Waterfall
    b. Iterative
    c. Agile (Scrum, Kanban)

    Implementation challenges across teams' and organizations

4. **Software Development Platforms:**

    a. What is Software Platform, examples
    b. Software Architectures
        i. 2-tier, 3-tier, N-tier architectures
            1. Terms and concepts
            2. Types; 2-tier, 3-tier, n-tier architectures
            3. Working of different types
            4. Design considerations
            5. Advantages and Disadvantages
    c. Front-end development tools, Application servers, Back-end development tools;
    d. Hardware/Software as a Service Platforms

5. **Exposure to programming paradigms and their differences;**

    a. What are programming paradigms
    b. Terminology and concepts
    c. Some important types
        i. Imperative / Procedural
        ii. Functional
        iii. Object-Oriented

iv. Logic Programming

d. Differences, similarities, real-world applications, Trade-offs

6. **Software Re-engineering**

7. **Topics in Project Management (PMI)**

    a. Processes Groups
    b. Process Interactions
    c. Project Integration Management
    d. Project Scope Management
    e. Project Time Management
    f. Project Communications Management

Course Assessment

Method	Weight
Quizzes (3-5) - scheduled and surprise	15
Mid-Term (1)	20
Readings, Workshops, Assignments (3-5)	25
Final Exam	40

Notes

1. This course is more practical (practices followed in software industry) rather theoretical.
2. Course includes significant research based activities. Research based assignments and class presentations will be part of this course.
3. Late assignments will not be marked.

Readings

1. Software Engineering, ninth-edition by Ian Sommerville (Topics from Chapters 1, 2, 3, 18)
2. Project Management Body of Knowledge (PMBoK) – Selected chapters
3. HCI - https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/human-computer-interaction-brief-intro
4. Software Processes Paper (paper will be provided)
5. The Scrum Guide™ - https://www.scrumguides.org/docs/scrumguide/v2017/2017-Scrum-Guide-US.pdf
6. SBOK Guide™ - https://www.scrumstudy.com/SBOK/SCRUMstudy-SBOK-Guide-2016.pdf
7. Client Server Architecture

   a. https://www.softwaretestingclass.com/what-is-difference-between-two-tier-and-three-tier-architecture/
   b. https://docs.microsoft.com/en-us/azure/architecture/guide/architecture-styles/n-tier
   c. https://www.codeproject.com/Articles/430014/N-Tier-Architecture-and-Tips#Tier%20and%20Layer%20Relationship
   d. http://www-935.ibm.com/services/multimedia/IBM_Future_of_Cloud_WEB.pdf
   e. https://medium.com/@sprocompany/what-is-the-future-of-cloud-computing-5-exciting-predictions-f96a047c0de8
8. Software Engineering, A Practitioner's Approach, FIFTH EDITION, Roger S. Pressman, Ph.D. (Chapter 30 – Software Reengineering)
9. Some course material will be provided.