Institute of Computer Science/Information Technology (ICS&IT)
Faculty of Management Sciences & CS/IT (FMCS)
The University of Agricultural Peshawar

Program : BS (CS)- 5th Semester
Course Name : Software Engineering II

Course Code : CC-503
Credit Hours : 03
Total Weeks : 16
Total Hours : 48

Course Objectives

At the end of the course, student will be able to understand the basic concepts of S/W engineering, life cycle of system design, and the complexity involved in it. The students will also be able to optimize the system, making it error free, and concentrate on quality using traditional S/W Engineering approaches.

Week	Topics Covered	Signature
01	• Introduction to Software & Software Engineering • Problems in Software Engineering • What is meant by software & Software Engineering • Characteristic of Software • Importance of Software Engineering • Difference between Software Engineering and Computer Science • Software Products • Essential Attributes of a good software • Software Process Activities • Software engineering ethics • Software Myths	
02	• Software Process Models • Generic process framework • Waterfall model • Incremental model • Prototyping model • Spiral model	
03	• Agile Methodology • Xtreme Programming • Scrum	
04	• Requirements Analysis and Specification • Problems with requirements practices • Understanding Requirements • Requirements Engineering	

	• Functional and non-functional requirements	
05	• The software requirements document • Requirements specification	
06	• Requirements engineering process • Establishing the groundwork • Eliciting Requirements • Developing Use Cases	
07	• Building the requirements model • Negotiating Requirements • Validating Requirements	
08	• Requirements Modeling (Scenarios, Information and Analysis Classes) • Requirements Analysis • Scenario-Based Modeling • UML Models that Supplement the Use Case • Data Modeling Concepts • Class-Based Modeling	
09	• Software Design • Design with Context of Software Engineering • The Design Process • Design Concepts • The Design Model	
10	• Architectural Design • Software Architecture • Architecture Styles • Architectural Design • Assessing Alternative Architectural Designs • Architectural Mapping Using Data Flow	
11	• Implementation and Testing • Software testing fundamentals • Internal and external views of testing • white box testing • Basis path testing • Control structure testing,	
10	• Black box testing • Regression testing • Unit testing • Integration testing • Validation testing, system testing and debugging	

11	• Software implementation techniques • Coding practices • Refactoring	
12	• Project Management • Estimation • FP based • LOC based • Make/buy decision	
13	• COCOMO II • Project Planning • Project plan • Planning process • RFP risk management • Identification • Projection	
14	• RMMM • Scheduling and tracking • Relationship between people and effort • Task set and network • Scheduling • EVA: Process and project metrics.	
15	• Quality Concepts • Quality Movements • S/W Quality Assurance	
16	• Evolution processes • Change processes for software systems • Program evolution dynamics • Understanding software evolution • Software maintenance • Making changes to operational software systems • Legacy system management • Making decisions about software change	