## UNIT – 6

**Architectural Patterns – 3:** Adaptable Systems: Microkernel; Reflection.
6 Hours

## UNIT – 7

**Some Design Patterns:** Structural decomposition: Whole – Part;
Organization of work: Master – Slave; Access Control: Proxy.
6 Hours

## UNIT – 8

**Designing and Documenting Software Architecture:** Architecture in the life cycle; Designing the architecture; Forming the team structure; Creating a skeletal system. Uses of architectural documentation; Views; Choosing the relevant views; Documenting a view; Documentation across views.
7 Hours

### Text Books:

1. Len Bass, Paul Clements, Rick Kazman: Software Architecture in Practice, 2nd Edition, Pearson Education, 2003. (Chapters 1, 2, 4, 5, 7, 9)
2. Frank Buschmann, Regine Meunier, Hans Rohnert, Peter Sommerlad, Michael Stal: Pattern-Oriented Software Architecture, A System of Patterns, Volume 1, John Wiley and Sons, 2007. (Chapters 2, 3.1 to 3.4)
3. Mary Shaw and David Garlan: Software Architecture- Perspectives on an Emerging Discipline, Prentice-Hall of India, 2007. (Chapters 1.1, 2, 3)

### Reference Books:

1. E. Gamma, R. Helm, R. Johnson, J. Vlissides: Design Patterns-Elements of Reusable Object-Oriented Software, Pearson Education, 1995.

**Web Reference:** http://www.hillside.net/patterns/

## SYSTEM MODELING AND SIMULATION

| | | |
|---|---|---|
| Sub Code: 10CS82 | IA Marks | : 25 |
| Hrs/Week: 04 | Exam Hours : 03 | |
| Total Hrs : 52 | | |
| Marks : 100 | | Exam |

### PART – A

## UNIT – 1

**Introduction:** When simulation is the appropriate tool and when it is not appropriate; Advantages and disadvantages of Simulation; Areas of
8 Hours

105

application; Systems and system environment; Components of a system; Discrete and continuous systems; Model of a system; Types of Models; Discrete-Event System Simulation; Steps in a Simulation Study. The basics of Spreadsheet simulation, Simulation example: Simulation of queuing systems in a spreadsheet.

## UNIT – 2
**6 Hours**

**General Principles, Simulation Software:** Concepts in Discrete-Event Simulation: The Event-Scheduling / Time-Advance Algorithm, World Views, Manual simulation Using Event Scheduling; List processing. Simulation in Java; Simulation in GPSS

## UNIT – 3
**6 Hours**

**Statistical Models in Simulation:** Review of terminology and concepts; Useful statistical models; Discrete distributions; Continuous distributions; Poisson process; Empirical distributions.

## UNIT – 4
**6 Hours**

**Queuing Models:** Characteristics of queuing systems; Queuing notation; Long-run measures of performance of queuing systems; Steady-state behavior of M/G/1 queue; Networks of queues; Rough-cut modeling: An illustration..

## PART – B

## UNIT – 5
**8 Hours**

**Random-Number Generation, Random-Variate Generation:** Properties of random numbers; Generation of pseudo-random numbers; Techniques for generating random numbers; Tests for Random Numbers Random-Variate Generation: Inverse transform technique; Acceptance-Rejection technique; Special properties.

## UNIT – 6
**6 Hours**

**Input Modeling :** Data Collection; Identifying the distribution with data; Parameter estimation; Goodness of Fit Tests; Fitting a non-stationary Poisson process; Selecting input models without data; Multivariate and Time-Series input models.

## UNIT – 7
**6 Hours**

**Estimation of Absolute Performance:** Types of simulations with respect to output analysis; Stochastic nature of output data; Absolute measures of performance and their estimation; Output analysis for terminating simulations; Output analysis for steady-state simulations.

## UNIT – 8
**6 Hours**

**Verification, Calibration, and Validation; Optimization:** Model building, verification and validation; Verification of simulation models; Calibration and validation of models, Optimization via Simulation

**Text Books:**
1. Jerry Banks, John S. Carson II, Barry L. Nelson, David M. Nicol: Discrete-Event System Simulation, 5th Edition, Pearson Education, 2010.
   (Listed topics only from Chapters 1 to 12)

**Reference Books:**
1. Lawrence M. Leemis, Stephen K. Park: Discrete – Event Simulation: A First Course, Pearson Education, 2006.
2. Averill M. Law: Simulation Modeling and Analysis, 4th Edition, Tata McGraw-Hill, 2007.

# WIRELESS NETWORKS AND MOBILE COMPUTING

| | | |
|---|---|---|
| **Sub Code: 10IS831** | **IA Marks** | **: 25** |
| **Hrs/Week: 04** | **Exam Hours** | **: 03** |
| **Total Hrs: 52** | **Exam Marks** | **: 100** |

## PART-A

## UNIT – 1
**6 Hours**

**Mobile Computing Architecture:** Types of Networks, Architecture for Mobile Computing, 3-tier Architecture, Design Considerations for Mobile Computing

## UNIT – 2
**7 Hours**

**Wireless Networks – 1: GSM and SMS:** Global Systems for Mobile Communication ( GSM and Short Service Messages ( SMS): GSM Architecture, Entities, Call routing in GSM, PLMN Interface, GSM Addresses and Identities, Network Aspects in GSM, Mobility Management, GSM Frequency allocation. Introduction to SMS, SMS Architecture, SM MT, SM MO, SMS as Information bearer, applications

## UNIT – 3
**6 Hours**

**Wireless Networks – 2: GPRS :** GPRS and Packet Data Network, GPRS Network Architecture, GPRS Network Operations, Data Services in GPRS, Applications for GPRS, Billing and Charging in GPRS

107