

1. Programme	:	Bachelor of Science in Computer Science(B.Sc.)	
2. Department	:	Computer Science	
3. Course Title	:	Data Communication & Networking	
4. Course Code	:	351 CS 51	
5. Course Duration	:	Semester V	
6. Lecturer Hours per Week	:	4	
7. Tutorial Hours per week	:	-	
8. Practical Hours per Week	:	-	
9. Course Credit	:	9	
10. Methods of Assessment	:	Assignments	20%
		Continuous Assessment Test	20%
		End Semester Examination	60%

11. Course Description :

The scope of this course is to provide students the fundamentals of data communications networks, working knowledge of data transmission concepts, understanding the operation of all seven layers of OSI Model and the protocols used in each layer.

12. Aim of the Course :

The aim of the course is to provide the students with the basic knowledge in Data Communication & Networking.

13. Learning Objectives :

At the end of the course students will be able to:

- Explain layered communication architectures (OSI and TCP/IP),
- Explain sockets programming,
- Explain the principles of congestion control and the principles of routing.

14. Topics of Study :

Unit I

Introduction to Data Communication- Networks – Protocols-A basics for Protocol Design-Protocol Layering. Basic Concepts: Line configuration – Topology- Transmission Mode- Categories of Networks – Internet - works. Case Study: Standard Organizations for developing Protocols.

Unit II

The OSI model: The model – Functions of the layers, Signals: Analog and Digital – Aperiodic – periodic Signals – Simple analog signals – Digital Signals.

Unit III

Encoding – Digital – to - Digital – Analog-to- Analog-Transmission of Digital Data: Digital Data Transmission – DTE – DCE Interface. Case Study: EIA232 Standard.

Unit IV

Modems: Transmission Rate - Modem Standards – Transmission Media: Guided Media – Unguided Media. Case Study: Modem Standards.

Unit V

Multiplexing: Many-to-One, One-to-Many – Types – Multiplexing - The Telephone System, Error Detection and Correction: types of Errors – Detection – Error Correction.^[1]Case Study: Multiplexing Application - The Telephone System.

15. Mode of Assessment :

Attendance is Compulsory. A student should secure 85% of attendance in the course to be eligible for appearing End Semester Examination. Minimum 2 assignments carrying 10 marks each shall be submitted for evaluation (Refer Assignment Policy). 2 Continuous Assessment Test covering 2.5 units are conducted at 6th week and 12th week respectively for 10 marks each. There shall be a End Semester Examination at the end of 15th week covering all 5 units for a 3 hour duration and evaluated for 60 marks. (Refer Examination Guidelines).

16. Prescribed Textbooks :

1. Nagpal D.P, 2011, Data Communications and Networking, First Edition, S.Chand, New Delhi.
2. Stallings William, 2007, Data & Computer Communications, Eight Edition, Pearson Education, ^[1]_{SEP}New Delhi.
3. Anok Singh & Chhabra A.K, 2010, Principles of Communication Engineering, Seventh Edition, S. chand Publications, New Delhi.
4. Kennedy and Davis, 2012, Electronic Communication Systems, Fifth Edition, Tata McGraw Hill, New Delhi.

17. Reference Materials :

1. Behrouz Forouzan, 2007, Introduction to Data Communications and Networking “, Tata McGraw Hill Edition, New Delhi.
2. Douglas E. Comer. 2000. Computer Networks and Internets, 2nd Edition. Pearson Education Asia, New Delhi.
3. Stanford H. Rowe and Marsha L. Schuh, 2005. Computer Networking, 1st Edition, Pearson Education.

1. Programme	:	Bachelor of Science in Computer Science(B.Sc.)	
2. Department	:	Computer Science	
3. Course Title	:	Software Engineering	
4. Course Code	:	351 CS 52	
5. Course Duration	:	Semester	
6. Lecturer Hours per Week	:	4	
Tutorial Hours per week	:	-	
Practical Hours per Week	:	-	
7. Course Credit	:	9	
8. Methods of Assessment	:	Assignments	20%
		Continuous Assessment Test	20%
		End Semester Examination	60%
9. Course Description	:		

The course introduce the students to software life cycle models. Software requirements engineering, formal specification and validation. Techniques for software design and testing. Cost estimation models. Issues in software quality assurance and software maintenance

10. Aim of the Course :

The aim of the course is to assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

11. Learning Objectives :

At the end of the course students will be able to:

- Explain the importance of the stages in the software life cycle;
- Discuss the characteristics and requirements of software;
- Discuss the software design;
- Explain the software testing;
- Design software by applying the software engineering principles.

12. Topics of Study :

Unit I

Software - Characteristics, Classification, Myths, Crisis, Software Engineering: Definition, Comparison with other disciplines, Ethics & professional practice, Phases in Software Engineering, Challenges, Software Process, Project, Product - Components of Software process ,process framework, process assessment, Software Life Cycle Models, Selection criteria, Process change management, Quantitative process management.

Unit II

Software Requirements – Definition, Types, Requirement Engineering process, Feasibility Study - Types of feasibilities, Process Requirements Elicitation - techniques, Requirements Analysis – Structured Analysis, Object Oriented Modeling, Other approaches, Requirements Specification – Structure of SRS, Requirements Validation, Requirements Management – A Case study

Unit III

Software Design – basic principles, concepts, Data design, Data Architectural design, Component level design, User Interface design, Pattern based Software design, Design Notations, Design Reviews – types, process, evaluating reviews, Software Design Documentation, A Case study, Software Coding – features, guidelines, Methodology, Programming practices, Verification techniques, documentation

Unit IV

Software Testing - basics, guidelines, characteristics, Test Plan – steps in development, Software testing strategies, V Model of Software testing, Levels of Software testing – Unit, Integration, System, Acceptance, Testing Techniques (basic idea of black box and white box testing), Object Oriented testing, Debugging, Software test report, Software Maintenance – basics, Legacy Systems, factors affecting maintenance, types of maintenance, Life cycle, Models, Techniques

Unit V

Software Planning and Scheduling – project planning, planning process, project plan, Project Scheduling – principles, techniques, Project staffing, Risk management, Software Quality – Concepts, Quality Assurance Activities, Software reviews, Evaluation, Capability Maturity Model, Software Reliability, Software Configuration Management process, Concept of Software Reengineering – approaches, process models.

13. Mode of Assessment :

Attendance is Compulsory. A student should secure 85% of attendance in the course to be eligible for appearing End Semester Examination. Minimum 2 assignments carrying 10 marks each shall be submitted for evaluation (Refer Assignment Policy). 2 Continuous Assessment Test covering 2.5 units are conducted at 6th week and 12th week respectively for 10 marks each. There shall be a End Semester Examination at the end of 15th week covering all 5 units for a 3 hour duration and evaluated for 60 marks. (Refer Examination Guidelines).

14. Prescribed Textbooks :

1. Rohit, Khurana, 2010, Software Engineering Principles And Practices, 2nd Edition, Vikas Publishing House Pvt. Ltd., New Delhi.
2. Rajib Mall, 2009, Fundamentals of Software Engineering, 3rd Edition, PHI, New Delhi.
3. Pressman S Roger, 2010, Software Engineering A Practitioners Approach, 7th edition, McGraw Hill, International Editions.
4. Sommerville, Ian, 2010, Software Engineering, 9th Edition, Addison Wesley.
5. Rumbaugh, James, 2005, Object Oriented Modeling and design, Pearson Education, New Delhi.

15. Reference Materials :

1. Kelkar. S. A. 2013. Software Project Management, 3rd Edition , Prentice Hall India, New Delhi.
2. Stephen Schach. 2007. Software Engineering , 7th Edition, Tata McGraw Hill, New Delhi.
3. Daniel Hoffman and Paul Strooner Software Design Automated Testing and Maintenance, Thomson Publications, Asia.
4. Richard Fairley. 1998. Software Engineering Concepts, 1st Edition, Tata McGraw Hill

Publishing, New Delhi.