Punjab Technical University, Jalandhar
Study Scheme
M.Tech (Information Technology)

Schedule of Teaching			**Schedule of Examination**				
Lecture	Tutorials	total		Time (Hrs)	Theory Marks	Sessional Marks	Viva	Total
			All theory Subjects	3	100	50		150
			Projects			50	50	100
			Seminar			100		100
			Dissertation			Satisfactory/Not Satisfactory		

SEMESTER-I

		L	**T**	**P**
CS-501	Advance Software Engineering	3	1	-
CS-503	Network Security	3	1	-
CS-505	Advanced Computer Architecture	3		-
CS-507	Advanced Database Management System	3	1	-
CS-509	Advanced Programming Language	3	1	-
CS-511	Advanced Software Engineering Lab	-	-	4
CS-513	Advanced Database Management System Lab	-	-	4

CS-501 Advance Software Engineering

L	T	P
3	1	-

Introduction: Life cycle models, Requirement Analysis and specification, Formal requirements specification.

Fundamental issues in software design: Goodness of design, cohesions, coupling. Function-oriented design: structured analysis and design. Overview of object –oriented concepts.

Unified Modeling Language (UML). Unified design process. User interface design. Coding standards and guidelines. Code walkthrough and reviews.

Unit testing. Black box and white box testing. Integration and system testing. Software quality and reliability.

SEI CMM and ISO 9001. PSP and Six Sigma. Clean room technique.

Software maintenance issues and techniques. Software reuse. Client-Server software development.

Reference:

1. Ian Sommeriele, “Software Engineering” , Addison Wesley.
2. C.Easteal and G.Davis, Software Engineering Analysis and Design, Tata McGraw Hill.
3. Pressman, Software Engineering –A Practitioner’s Approach.
4. Richard Fairley ,Software Engineeering Concepts ,Tata Mcgraw Hill.
5. Pankaj Jalote , An Integrated Approach to Software engineering, Narosa Publication.

CS-503 Network Security

L	T	P
3	1	-

Introduction :

Overview of computer networks, seven-layer architecture, TCP/IP suite of protocols, etc.

MAC protocols for high-speed LANS,MANS and wireless LANs. (For Example, FDDI,DQDB,HIPPI, Gigabit Ethernet, Wireless Ethernet, etc.)

Fast access technologies(For Example, ADSL, Cable Modem, etc.

Ipv6: Basic Protocol, extensions and options, support for QoS, security ,etc., neighbour discovery, auto-configuration, routing. Changes to other protocols. Application Programming Interface for IPV6.

Mobility in networks. Mobile IP, Security related issues.

IP Multicasting, Multicast routing protocols, address assignments, session discovery, etc.

TCP extension for high-speed networks, transaction-oriented applications. Other new options in TCP.

Network security at various layers. Secure-HTTP,SSL,ESP, Authentication header, key distribution protocols,. Digital signatures, digital certificates.

References:

W.R.Stevens. TCP/IP Illustrated, Volume 1: The Protocols, Addison Wesley, 1994.

R.Wright.TCP/IP Illustrated, Volume 2: The Implementation, Addison Wesley , 1995.

W.R Stevens. TCP/IP Illustrated, Volume 3: TCP for Transactions, HTTP, NNTP and the unix domain protocols, Addison Wesley, 1996.

CS- 505 Advance Computer Architecture

L	T	P
3	-	-

1. Computational model
2. The concept of Computer Architecture
3. Introduction to Parallel Processing
4. Introduction to ILP Processors
5. Pipelined Processors
6. VLIW Architecture
7. Super Scalar Processors
8. Processing of Control transfer instruction
9. Code Scheduling for ILP-processors
10. Introduction to Data Parallel Architecture, SIMD Architecture, MIMD Architecture
11. Vector Architecture.
12. Multi threaded Architecture
13. Distributed Memory MIMD Architecture
14. Shared memory MIMD Architecture.

Reference:

1. Dezso Sima , Terence Fountani, Peter Kacsuie , “Advanced Computer Architectures : A Design Space Approach, 1/e , Pearson Eduction.
2. Computer Architecture by Stone

CS-507 Advance Database Management Systems

L	T	P
3	1	-

Introduction of DBMS ,Types of DBMS and their advantages and disadvantages
Introduction of RDBMS, Types of relational query language, Normalization, Query optimization
Database protection in RDBMS –Integrity, Concurrency control, Recovery
Distributed Databases :- concepts, structure, trade-offs
Methods of data distribution –fragmentation, replication, design & advance concepts of DDBMS
Introduction to object oriented databases ,Deductive databases
Data warehousing Concepts: Architecture, Dataflows, Tools & Technologies, Data Marts
Data Mining & Online Analytical Processing
Spatial & Multimedia databases
Mobile Computing & Mobile Databases

Textbooks:-

1) Elmasri, Navathe, ”Fundamentals of Database Systems”, Pearson Education.
2) Henry F. Korth, A Silberschatz, ”Database Concepts”, Tata Mc Graw Hill.
3) Thomas Conolly, Carolyn Begg,” Database Systems”, Pearson Education.
4) Alexis Lcon, Mathews Leon, ”Database Management Systems”.
5) C.J.Date ,”An Introduction to DBMS”, Narosa Publishing House.

CS_509 ADVANCED PROGRAMMING LANGUAGES

L	T	P
3	1	-

Introduction: Brief history of Programming Language, Characteristics of programming language.

Programming Language Processors: The structure and operation of a computer, Hardware and firmware computers, Translator and simulator computers, Syntax, semantics and virtual computers, hierarchies of computers, binding and binding time

Elementary Data Types: Data object, variable and constants, data types, specification of elementary data types, declarations, type checking and type conversion, assignment and initialization, numeric data types, enumerations, Boolean, characters

Structured Data Types: Structured data object and data types, specification of data structure types, implementation of data structure types, declarations and type checking for data structures, vector and arrays, record, character strings, variable sized data structures, pointers and programmer-constructed data objects, sets, file and input/output

Subprogram And Programmer-Defined Data Types: Evolution of the data type concept, Abstraction, encapsulation, and information hiding, subprogram, type definitions, abstract data types

Sequence Control: Implicit and explicit sequence control, sequence control within expression, sequence control between statements, subprogram sequence control, recursive subprogram, exceptions and exception handlers, Co-routines, scheduled subprograms, tasks and concurrent execution, data structures and sequence control.

Data Control: names and referencing environments, static and dynamic scope, block structure, local data and local referencing environments, shared data, task and shared data.

Storage Management: Major Runtime elements requiring storage, programmer and system controlled storage management, storage management phases, static storage management, stack based storage management, heap storage management

Syntax And Translation: General syntactic criteria, syntactic elements of language, stages in translation, formal definition of syntax.

Operating And Programming Environment: Batch processing environment, interactive environments, embedded system environments, programming environments

Theoretical Models: Problem in syntax and translation, problem in semant

References:

Programming Languages, design and implementation second edition by Terrence W. Pratt Prentice Hall of India pvt.ltd. New Delhi

CS-511 & CS-513 Project Lab
(DBMS & Software Engineering)

L	T	P
-	-	4

The Students are required to implement the applications based on

1. Fuzzy databases
2. Expert databases
3. Object-oriented Databases
4. Distributed databases
5. Library management system
6. Crop management system
7. On-line sharing of computer systems
8. Highway systems
9. Hospital management system
10. Hotel management system
11. University management system
12. Inventory control
13. Railway management system
14. Any other similar database system