University Grant Commission

Bachelor of Vocational (B.Voc.)

ShikshanPrasarakSansthas

S. N. Arts, D. J. M. Commerce and B. N. S. Science College, Sangamner

Dist.Ahmednagar -422605

Software Development (SD)

1. Discipline	**:Science**
2. Name of the Course	**: Software Development (SD)**
3. Co-ordinate Department	**: Dept. Of Computer & Electronic Sciences**
4. Name Of Coordinator	**: Prof. R.S.Laddha**

B.Vocational(Software Development)

Aim:

Student should be able to design, develop, operate and maintain the software .

Objectives:

1. To develop web based applications in anyfield.
2. To make the student will be able to play important role in marketing of software.
3. To provide training about software to software users.

Programme	NameoftheSpecialization (*)	JobRolesproposedtobecoveredin each year(AlongwithNSQFlevel)		
		Yr-1	Yr-2	Yr-3
Information Technology	Software Development(SD)	Development of Language and Communication skill.	Conceptual and practical understanding.	Development of abilities/skill to tackle problems related networking.
		Development of Practical skills required to accomplish task and solved problems.	To design framework of software.	Development of professional Websites.
		Development of abilities to implements small programs.	Development of practical skill required to generate solution to specific problem related to hardware.	Development of basic skills in software design and maintenance
		Practical skill of presentation.	Development of independent software modules.	Able to find the problems in software.

Syllabus Structure B.Vocational (Software Development)

Course Code	Section	First Year	Credits
		Sem-I	
SDT-11	**SECTION-I**	Soft Skill –English and CommunicationSkill-I	02
	SECTION-II	Computer Fundamentals-I	02
SDT-12	**SECTION-I**	HTML5 & CSS3–I	02
	SECTION-II	Applied Mathematics -I	02
SDT-13	**SECTION-I**	Introduction to C Programming-I	02
	SECTION-II	Database Management System-I	02
SDP-14		Practical I Soft skill Development	
		Lab work	02
		Field Work	02
		Self-Learning	02
SDP-15		Practical –II C Programming Computer Hardware ,OS & N/W	
		Lab Work C Programming	02
		Field work Computer Hardware ,OS & N/W	02
		Self-Learning (Seminar ,e-content ,Activity)	02
SDP-16		Practical –III Database management System ,HTML5&CSS3	
		Lab Work	02
		Field Work based on Project	02
		Mini Project	02
		Sem-II	
SDT-21	**SECTION-I**	Soft Skill –English and CommunicationSkill-II	02
	SECTION-II	Computer Fundamentals-II	02
SDT-22	**SECTION-I**	HTML5 & CSS3 –II	02
	SECTION-II	Applied Mathematics -II	02
SDT-23	**SECTION-I**	Introduction to C Programming-II	02
	SECTION-II	Database Management System-II	02
SDP-24		Practical I Soft skill Development	
		Lab work	02
		Field Visit/Field Work	02
		Self-Learning	02
SDP-25		Practical –II C Programming Computer Hardware ,OS & N/W	
		Lab Work C Programming	02
		Field work Computer Hardware ,OS & N/W	02
		Self-Learning (Seminar ,e-content ,Activity)	02
SDP-26		Practical –III Database management System ,HTML5&CSS3	
		Lab Work	02
		Field Work based on Project	02

		Mini Project	02
		Second Year	
		Sem-III	
SDT-31	**SECTION-I**	Operating System –I	02
	SECTION-II	Introduction to C#.NET –I	02
SDT-32	**SECTION-I**	Software Engineering-I	02
	SECTION-II	Object Oriented Programming using CPP-I	02
SDT-33	**SECTION-I**	Networking-I	02
	SECTION-II	PHP-I	02
SDP-34		Practical I Introduction to C#.NET	
		Lab work	02
		Field Work (Market Survey about Software)	02
		Self-Learning(PPT,E-Content & activity)	02
SDP-35		Practical –II CPP	
		Lab Work	02
		Activity	02
		Self-Learning (PPT,E-Content & activity)	02
SDP-36		Practical –III PHP	
		Lab Work	02
		Field Work (based on project)	02
		Project	02
		Sem-IV	
SDT-41	**SECTION-I**	Operating System –II	02
	SECTION-II	Introduction to C#.NET –II	02
SDT-42	**SECTION-I**	Software Engineering-II	02
	SECTION-II	Object Oriented Programming using CPP-II	02
SDT-43	**SECTION-I**	Networking –II	02
	SECTION-II	PHP-II	02
SDP-44		Practical I Introduction to C#.NET –II	
		Lab work	02
		Field Work/Field Visit	02
		Self-Learning	02
SDP-45		Practical –II CPP	
		Lab Work	02
		Activity	02
		Self-Learning	02
SDP-46		Practical –III PHP	
		Lab Work	02
		Field Work (Based on project)	02
		Project	02

		Third Year	
		Sem-V	
SDT-51	**SECTION-I**	ASP.net	02
	SECTION-II	OOSE	02
SDT-52	**SECTION-I**	Mobile Computing	02
	SECTION-II	Core Java	02
SDT-53	**SECTION-I**	RDBMS	02
	SECTION-II	Web Development using CMS-I	02
SDP-54		Practical I ASP .net	
		Lab work	02
		Field Work/Activity (related to website)	02
		Self-Learning	02
SDP-55		Practical –II Core Java	
		Lab Work	02
		Field Work/Field visit	02
		Self-Learning	02
SDP-56		Practical –III Web Development using CMS	
		Lab Work	02
		Field Work (Based on project)	02
		Project	02
		Sem-VI	
SDT-61	**SECTION-I**	Computer Graphics	02
	SECTION-II	Software Testing	02
SDT-62	**SECTION-I**	Mobile Programming using Android	02
	SECTION-II	Advanced Java	02
SDT-63	**SECTION-I**	Multimedia	02
	SECTION-II	Web Development using CMS-II	02
SDP-64		Practical I Mobile Programming using Android	
		Lab work	02
		Project(Android App)	02
		Self-Learning	02
SDP-65		Practical –II Advanced Java	
		Lab Work	02
		Field Work/Field visit	02
		Self-Learning	02
SDP-66		Practical –III Web Development using CMS	
		Lab Work	02
		Field Work (Based on project)	02
		Project	02

Second Year

1) Operating System –I

Total lectures: 30 Credits: 02 Sem-III

Objectives :

1. To know system programming

2. To know services provided by operating system

3. To know the Scheduling concepts

Syllabus

Operating System –I		
No	**Topic**	**Lectures**
1	**Introduction to System Program** **1.** Introduction (Types and comparison of types of software) 2.Components of System Programming (Definitions only) 1.1 Assemblers 1.2 Loaders 1.3 Macros 1.4 Compilers and Interpreters 1.5 Editors 1.6 Debuggers	8
2	**Introduction to Operating System** **2.1** Definition of operating system 2.2.Services provided by OS 2.3 Types of OS (Definitions only) 2.3.1 Early System 2.3.2 Mainframe System 2.3.3 Desktop System 2.4 System Calls : definition , implementation 2.5 Types of System Calls 2.5.1 Process or job control 2.5.2 Device Management 2.5.3 File Management 2.5.4 Information Maintenance 2.5.5 Communication 2.5.5 System call implementation 2.6 System Program	4
3	**Process Management** **3.1** Introduction and definition of process 3.2 Process state transition 3.3. Process Control Block 3.4 Process Scheduling 3.5 Scheduling queues 3.6 Types of schedulers 3.6.1 Long Term Schedulers 3.6.2 Middle Term Schedulers	6

	3.6.3 Short Term Schedulers 3.6.4 IO Scheduler 3.7 Context Switch	
4	**Threads** **4.1** Multithreading 4.2 Threading Issues 4.3 P Threads, Solaris – 2, Windows 2000, Linux, 4.4 Java Threads : Introduction only, no coding)	02
5	**CPU Scheduling** 5.1 Introduction 5.2 Scheduling Concepts 5.3 CPU- I/O Burst Cycle 5.4 CPU Scheduler 5.5 Preemptive and Non-preemptive scheduling 5.6 Dispatcher 5.7 Scheduling criteria (terminologies used in scheduling) 5.8 CPU Utilization, Throughput, Turnaround time, Waiting time,Response time 5.9 Scheduling Algorithms FCFS,SJF (Preemptive & non-preemptive), Priority Scheduling (Preemptive & non-preemptive), Round Robin Scheduling, Multilevel Queues Multilevel Feedback queues 5.10 Examples on scheduling algorithms	10

References:

1. **System Programming and Operating System – D. M. Dhamdhere**
2. **System Software – An introduction to systems programming – Leland L. Beck**
3. **Operating System Concepts – Silberschatz, Galvin, Gagne**

2) PHP Programming-I

Total lectures: 30 Credits: 02 Sem-III

Objective:

1. Designing of dynamic, attractive Web pages using PHP.
2. Better understanding of how PHP, HTML and database work together to produce dynamic pages.
3. Designing robust & rich professional web applications.

Syllabus

PHP Programming-I		
No	**Topic**	**Lectures**
1	**Introduction to web techniques** 1.1 HTTP basics, Introduction to Web server and Web browser 1.2 Introduction to PHP 1.3 What does PHP do? 1.4 Lexical structure 1.5 Language basics	4
2	**Function and String** 2.1 Defining and calling a function 2.2 Default parameters 2.3 Variable parameters, Missing parameters 2.4 Variable function, Anonymous function 2.5 Types of strings in PHP 2.6 Printing functions 2.7 Encoding and escaping 2.8 Comparing strings 2.9 Manipulating and searching strings 2.10 Regular Expressions	6
3	**Arrays** 3.1 Indexed Vs Associative arrays 3.2 Identifying elements of an array 3.3 Storing data in arrays 3.4 Multidimensional arrays 3.5 Extracting multiple values 3.6 Converting between arrays and variables 3.7 Traversing arrays 3.8 Sorting 3.9 Action on entire arrays 3.10 Using arrays	6
4	**Introduction to Object Oriented Programming** 4.1 Classes 4.2 Objects 4.3 Introspection 4.4 Serialization 4.5 Inheritance 4.6 Interfaces 4.7 Encapsulation	8
5	. **Files and directories** 5.1 Working with files and directories 5.2 Opening and Closing, Getting information about file, Read/write to file,	6

	5.3 Splitting name and path from file, Rename and delete files 5.4 Reading and writing characters in file 5.5 Reading entire file 5.6 Random access to file data 5.7 Getting information on file 5.8 Ownership and permissions	
6	**Web Techniques** 6.1 Variables 6.2 Server information 6.3 Processing forms 6.4 Setting response headers 6.5 Maintaining state 6.6 SSL	8
7	**Databases** 7.1 Using PHP to access a database 7.2 Relational databases and SQL 7.3 PEAR DB basics 7.4 Advanced database techniques 7.5 Sample application (Mini project)	10
8	**Generating Graphics** 8.1 Basics of computer graphics 8.2 Working with Raster images 8.3 Manipulating Raster images 8.4 Using text in images	6
9	**XML** 9.1 What is XML? 9.2 XML document Structure 9.3 PHP and XML 9.4 XML parser 9.5 The document object model 9.6 The simple XML extension 9.7 Changing a value with simple XML	6
10	**Handling email with php** 10.1Email background 10.2Internet mail protocol 10.3Structure of an email message 10.4Sending email with php 10.5Email id validation and verification	6
11	**Web services** 11.1Web services concepts 11.2WSDL 11.3Introduction to 11.4SOAP XML-RPC 11.5Creating web services 11.6Calling web services	5

References

1. Programming PHP, RasmusLerdorf and Kevin Tatroe, O'Reilly publication

2. Beginning PHP 5, Wrox publication
3. PHP web sevices, Wrox publication
4. Mastering PHP, BPB Publication
5. PHP cookbook, O'Reilly publication
6. Learning PHP and MYSQL, O'Reilly publication
7. PHP and MYSQL, O'Reilly publication
8. www.W3schools.com

3) Object Oriented Concepts and Programming in C++ -I

Total lectures: 30 Credits: 02 Sem-III

Objectives :

1. Acquire an understanding of basic object oriented concepts and the issues involved in effective class design
2. In order to write C++ programs that use object oriented concepts such as Information hiding, constructors, destructors, inheritance etc.

Syllabus

Object Oriented Concepts and Programming in C++ -I		
No	**Topic**	**Lectures**
1	**1. Object oriented concepts** 1.1 Object oriented methodology 1.2 Features, advantages and Applications of OOPS	3
2	**Introduction to C++** 2.1 Data types, new operators and keywords, type conversion in C++ 2.2 Introduction to reference variables 2.3 Classes & Objects 2.4 Classes & Object specifiers 2.5 Defining data members and member functions 2.6 Array of objects 2.7 Managing consol I/O 2.8 C++ stream classes 2.9 Formatted and unformatted console I/O 2.10 Usage of manipulators	10
3	**Function in C++** 3.1 Call by reference, Return by reference 3.2 Function overloading and default arguments 3.3 Inline function 3.4 Static class members 3.5 Friend functions	6
4	**Constructors and destructor** 4.1 types of constructors 4.2 memory allocation (new and delete) 4.3 usage of destructor	5
5	Operator overloading 5.1 overloading unary and binary operators 5.2 overloading using friend function 5.3 usage of this pointer 5.4 overloading insertion and extraction operator	6

References:

1. **Object Oriented Programming with C++ by E. Balagurusamy**
2. **Object Oriented Modeling and Design by James Rambough**
3. **The Complete Reference C++ by Herbert Shildth**
4. **Let us C++ by – YashwantKanitkar**
5. **Object Oriented Programming with C++ by Robert Lafore**

4) Software Engineering-I

Total lectures: 30 Credits: 02 Sem-III

Objectives :

1. To teach concepts of Software Engineering
2. To teach principles of Software Engineering
3. To teach various process models used in practice
4. To know about the system engineering and requirement engineering
5. To build analysis model

Syllabus

Software Engineering-I		
No	**Topic**	**Lectures**
1	**Introduction To Software Engineering** 1. Definition 2. Characteristics of A Software 3. Mc Call's Quality Factors.	5
2	**Software Development process** 1. SDLC 2. . Waterfall Model, Spiral Model, prototyping approach, GLapproach. 3. Requirement Analysis. 4. Definition of System Analysis, Role of system analyst 5. Requirement anticipation, investigation and specification 6. Feasibility study, 7. Fact finding techniques-interview, quetionnair, record a. review, observation	12
3	**Analysis and design tools.** 1. E-R analysis 2. Decision tree and decision tables 3. DFD (physical and logical) 4. Data dictionary-definition, component, advantages 5. Input and output design 6. Case studies(atleast 4 should be covered)	10
4	**System design** 1. Qualities of good design	3

References:

1. Software Engineering – Pressman
2. Analysis and Design of Information System – James Seann
3. System Analysis and Design – Parthsarthy – Khalkar.

5) COMPUTER NETWORK -I

Total lectures: 30 Credits: 02 Sem-III

Syllabus

COMPUTER NETWORK -I		
No	**Topic**	**Lectures**
	Data Communication 1 characteristics of data communication, components, data representation, data flow. 2 Computer Networks Distributed processing, Physical structure-Pointto Point, Broadcast, Categories of topology (mesh,star,ring,bus,etc.) 3 Categories of network LAN,WAN,MAN,INTERNET etc. 4 Protocols and Standards Definition of protocol, key elements , Defacto&Dejure standard, Standards organizations. 4 Network Software 5 Protocol Hierarchies layers, protocols, peers, interfaces,	6
	Network Models 1 OSI Reference model 2 Functionality of each layer TCP/IP model 3 Introduction to IP,TCP & UDP TCP/IP ProtocolSuite 3 Addressing 4 Physical, Logical & Port addresses	8
	The Physical Layer 1. The Basic Concepts of analog & digital signals Bit rate, bit length, base band transmission Transmission Impairments – attenuation, distortion and noise 2 Data Rate Limits – Nyquist's bit rate formula for noiseless channel and Shannon's law Problems on above concepts 3 Performance of the Network Bandwidth, Throughput, Latency(Delay), Bandwidth –Delay Product, Jitter Problems on above concepts 4 Line Coding digital to digital conversion Characteristics, Line Coding Schemes Unipolar,	5

	NRZ, RZ, Manchester and Differential Manchester 5.Switching Circuit Switching, Message Switching and Packet Switching	
	The Data Link Layer 1. Framing Character Count, Byte Stuffing, Bit Stuffing and Physical Layer Coding Violations 2. Error Control 3. Hamming Code and CRC Elementary data link protocols Simplex stop & wait protocol, Simplex protocol for noisy channel. 4. Sliding Window Protocols 1-bit sliding window protocols, Pipelining – Go-Back N and Selective Repeat	7
	The Medium Access Sub layer 1. Random Access Protocols 2. ALOHA – pure and slotted 3. CSMA – 1-persistent, p-persistent and nonpersistent CSMA/CD, CSMA/CA 4. Controlled Access Reservation, Polling and Token Passing Channelization 5. FDMA, TDMA and CDMA	

References:

1. Computer Networks, Tanenbaum, ISBN:788177581652, Pearson
2. Data Communication and Networking by BehrouzForouzan
3. Computer Networking and the Internet,Halsall / Kulkarni, ISBN:9788177584752, Pearson
4. Data Communications and Networks: An Engineering Approach, Irvine, Wiley India,
5. Elements of Network Protocol Design, Gouda, ISBN:9788126516476, Wiley India
6. Computer Networks-A Systems Approach, 5e , Peterson, ISBN :9789380501932, Elsevier

6) C#.NET –I

Total lectures: 30 Credits: 02 Sem-III

Objectives :

To understand the DOTNET framework, C# language features and Web development using ASP.NET

Syllabus

C#.NET –I		
No	**Topic**	**Lectures**
1	**DOTNET Framework** 1. Introduction to DOTNET 2. DOT NET class framework 3. Common Language Runtime Overview Elements of .NET application Memory Management Garbage Collector : Faster Memory allocation, Optimizations 4. Common Language Integration Common type system Reflection API 5. User and Program Interface	4
2	**Introduction to C#** 1. Language features Variables and Expressions, type conversion Flow Control Functions, Delegates Debugging and error handling, exception handling (System Defined and User Defined) 2. Object Oriented Concepts Defining classes, class members, Interfaces, Properties Access modifiers, Implementation of class, interface and properties Concept of hiding base class methods, Overriding Event Handling 3. Collections, Comparisons and Conversions Defining and using collections, Indexers, iterators Type comparison, Value Comparison Overloading Conversion operators, as operator 4. Generics Using generics Defining Generics, generic Interfaces, Generic methods, Generic Delegate	10
3	**Window Programming**	10

	1 Window Controls Common Controls Container Controls Menus and Toolbars Printing Dialogs	
4	**Deploying Window Application** 1. Deployment Overview 2.Visual studio setup and Deployment project types 3. Microsoft windows installer architecture 4. Building the project : Installation	6

References:

1. Beginning Visual C#, Wrox Publication
2. Professional Visual C#, Wrox Publication
3. Inside C#, by Tom Archer ISBN: 0735612889 Microsoft Press Â© 2001, 403 pages
4. Beginning ASP.NET 3.5, Wrox Publication
5. Programming ASP.NET 3.5 by Jesse Liberty, Dan Maharry, Dan Hurwitz, O'Reilly
6. Illustrated C# 2008, Solis, Publication APRESS, ISBN 978-81-8128-958-2
7. Professional C# 4.0 and .NET 4by Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson, Morgan Skinner, WROX
8. Beginning C# Object-Oriented Programming By Dan Clark ,Apress
9. ADO.NET Examples and Best Practices for C# Programmers, By Peter D. Blackburn Apress
10. Database Programming with C#, By Carsten Thomsen, Apress

1) Operating System-II

Total lectures: 30 Credits: 02 Sem-IV

Objective:-

1) To Know the Basics Of Computer
2) To Understand the Basics of Operating systems
3) ToUndestand how to use software packages in day to day activities

Syllabus

Operating System-II		
No	**Topic**	**Lectures**
1	**Process Synchronization** 1. Introduction 2. Critical section problem 3. Semaphores 4. Concept 5. Implementation 6. Deadlock & Starvation 7. Binary Semaphores 8. Problems of synchronization 9. Bounded buffer problem 10. Readers & writers problem 11. Dining Philosophers problem 12. Critical Sections 13. Monitors	6
2	**Deadlocks** 1. Introduction 2. Deadlock Characterization 3. Necessary Condition 4. Resource allocation graph 5. Examples 6. Handling Deadlock 7. Deadlock Prevention 8. Mutual Exclusion 9. Hold & wait 10. No preemption 11. Circular wait 12. Deadlock Avoidance 13. Safe State 14. Resource allocation graph algorithm 15. Bankers algorithm 16. Examples 17. Deadlock Detection 18. Single instance of each resource type 19. Several instances of a resource type 20. Detection algorithm usage 21. Recovery from deadlock 22. Process Termination 23. Resource Preemption	2
3	**Memory Management**	7

	1. Introduction to memory management 2. Problems with memory management 3. Logical vs. physical addresses 4. Dynamic vs. static linking 5. Overlays (Ref from Ch. 5, Examples only) 6. Resident monitor 7. Swapping 8. Contiguous memory allocation (No Problems, only concept) i. Single contiguous memory managementmodule ii. Multiple contiguous memory managementmodule 9. Non-contiguous memory allocation (NoProblems, only concept) i. Paging ii. Segmentation iii. Segmentation with paging iv. Virtual memory v. Demand paging vi. Page replacement algorithms i. FIFO ii. MRU iii. LRU iv. LRU approximation using reference bit v. MFU vi. LFU vii. Second Chance algorithm viii. Optimal replacement ix. Examples on Page replacement algorithm.	
4	**File System** 1. Introduction & File concepts (file attributes,operations on files) 2. Access methods 3. Sequential access 4. Direct access 5. Indexed access 6. File structure 7. File system mounting and sharing 8. Allocation methods Contiguous allocation Linked Allocation Indexed Allocation 9. Free space management Bit map or bit vector Linked list Grouping Counting 10. File protection	8
5	**Device Management & I/O System** 1. Introduction and I/O Hardware	7

	2. Interrupt (Maskable and non maskable) 3. Kernel I/O Subsystem 4. I/O Scheduling 5. Buffering 6. Caching 7. Spooling and device Reservation 8. Error Handling 9. Kernel Data Structures 10. Disk Scheduling First Come First Served FCFS Shortest seek time first (SSTF) Scan C-Scan LOOK C-LOOK	

References:

1. System Programming and Operating System – D. M. Dhamdhere

2. System Software – An introduction to systems programming – Leland L. Beck (Pearson Edition)

3. Operating System Concepts – Silberschatz, Galvin, Gagne

2)PHP Programming-II

Total lectures: 30 Credits: 02 Sem-IV

Objective:

1. Designing of dynamic, attractive Web pages using PHP.
2. Better understanding of how PHP, HTML and database work together to produce dynamic pages.
3. Designing robust & rich professional web applications.

Syllabus

PHP Programming-II		
No	**Topic**	**Lectures**
1	**Web Techniques** 1. Variables 2. Server information 3. Processing forms 4. Setting response headers 5. Maintaining state 6. SSL	6
2	**Databases** 7.6 Using PHP to access a database 7.7 Relational databases and SQL 7.8 PEAR DB basics 7.9 Advanced database techniques 7.10 Sample application (Mini project)	8
3	**Generating Graphics** 1. Basics of computer graphics 2. Working with Raster images 3. Manipulating Raster images 4. Using text in images	6
4	**XML** 1. What is XML? 2. XML document Structure 3. PHP and XML 4. XML parser 5. The document object model 6. The simple XML extension 7. Changing a value with simple XML	4
5	**Handling email with php** 1. Email background 2. Internet mail protocol 3. Structure of an email message 4. Sending email with php 5. Email id validation and verification	3
6	**Web services** 1. Web services concepts 2. WSDL 3. Introduction to 4. SOAP XML-RPC 5. Creating web services 6. Calling web services	3

References

1. Programming PHP, RasmusLerdorf and Kevin Tatroe, O'Reilly publication
2. Beginning PHP 5, Wrox publication
3. PHP web sevices, Wrox publication
4. Mastering PHP, BPB Publication
5. PHP cookbook, O'Reilly publication
6. Learning PHP and MYSQL, O'Reilly publication
7. PHP and MYSQL, O'Reilly publication
8. www.W3schools.com

3) Object Oriented Concepts and Programming in C++ -II

Total lectures: 30 Credits: 02 Sem-IV

Objectives :

1. Acquire an understanding of basic object oriented concepts and the issues involved in effective class design
2. In order to write C++ programs that use object oriented concepts such asinformation hiding, constructors, destructors, inheritance etc.

Syllabus

Object Oriented Concepts and Programming in C++ -II

No	Topic	Lectures
1	**Inheritance** 1 types of inheritance with examples 2 virtual base classes and abstract base classes 3 constructor and destructor in derived class 4 virtual functions and pure virtual function	10
2	**Working with files** 1 File operations 2 File pointer and their manipulation 3 File updation with random access	8
3	**Templates** 1 Introduction to templates, 2 Class templates, function templates and overloading of function templates 3 With multiple parameters 4 CASE study on STL (with reference to container classes, operational utilities)	5
4	**Exception Handling in C++** 1 try, catch and throw primitives	7

References:

1. Object Oriented Programming with C++ by E. Balagurusamy
2. Object Oriented Modeling and Design by James Rambough
3.The Complete Reference C++ by Herbert Shildth
4.Let us C++ by – YashwantKanitkar
5.Object Oriented Programming with C++ by Robert Lafore

4) Software Engineering -II

Total lectures: 30 Credits: 02 Sem-IV

Objectives :

1. To teach concepts of Software Engineering
2. To teach principles of Software Engineering
3. To teach various process models used in practice
4. To know about the system engineering and requirement engineering
5. To build analysis model

Syllabus

Software Engineering –II		
No	**Topic**	**Lectures**
1	**System testing** **1.** Testing and debugging definition 2. Testing objectives and principles 3. Performance testing 4. User acceptance techniques 5. Stress testing 6. Test data generators.	8
2	**System maintenance.** 1. Importance of maintenance 2. Software maintenance 3. Types of maintenance 4. Maintenance side effects. 5. Reverse engineering 6. Re-engineering	5
3	**Concept of software management** **1.** The software crisis, 2. Principles of software engineering, 3. Programming in small vs. programming in large. 4. Software measurement.	7
4	**Project management** **1.** relationship of life cycle 2. project planning , project control 3. project organization 4. risk management 5. cost models 6 configuration management 7. version control 8. quality assurance 9. Metrics.	10

References:

1. **Software Engineering – Pressman**
2. **Analysis and Design of Information System – James Seann**
3. **System Analysis and Design – Parthsarthy – Khalkar.**

5) NETWORKING -II

Total lectures: 30 Credits: 02 Sem-IV

Objectives :Syllabus

NETWORKING -II		
No	**Topic**	**Lectures**
1	**Wired & wireless Lans** 1. Ethernet Standard 2. Frame Format, Access Method and Physical Layer 3. Changes In The Standard – Bridged 4. Ethernet, Switched Ethernet, Full Duplex Ethernet 5. Fast Ethernet – Goals and MAC Sub layer Specifications 6. Gigabit Ethernet – goals, MAC Sub layer Specifications 7. Wireless Lan 8. Architecture – BSS & ESS	8
2	**The Network layer** 1. Design Issues 2. Store-and-forward packet switching, Services Provided to the Transport Layer, Implementation of Connectionless Service, Implementation of 3. Connection Oriented Service, Comparison of Virtual Circuit and Datagram 4. Logical Addressing 5. IPV4 Addresses – Address Space, Notations, Classful Addressing, Classless Addressing, Network Address Translation(NAT) 6. IPV6 Addresses – Addressing Structure, Address Space 7. IPV4 Protocol Datagram Format, Fragmentation, Checksum, Options 8. IPV6 Protocol Advantages, Packet Format, Extension Headers 9. Transition From IPV4 to IPV6 10. Dual Stack, Tunneling, Header Translation 11. Routing Concepts 12. Properties of routing algorithm, Comparison of Adaptive and Non-Adaptive RoutingAlgorithms 13. Congestion Control	8
3	**The Transport layer** 1. Process-to-Process Delivery 2. Client Server Paradigm, 3. Multiplexing and De-multiplexing, 4. Connectionless Vs Connection-Oriented	8

	Service, 5. Reliable Vs Unreliable 6. User Datagram Protocol UDP 7. Datagram Format, Checksum, UDP operations, Use of UDP 8. Transmission Control Protocol (TCP) TCP Services, TCP Features, TCP Segment, TCP Connection, Flow Control, Error Control TCP Congestion Control	
4	**The Application layer** 1. Domain Name System (DNS) Name Space, Domain Name Space, Distribution of Name Space, DNS in the Internet, Name – Address Resolution 2. TELNET Timesharing Environment, 3. Logging, NVT, Embedding, Options, Mode of Operations 4. E-MAIL Architecture, User Agent, Message Transfer Agent-SMTP, Message Access Agent-POP, IMAP, Web Based Mail 5. File Transfer Protocol (FTP) Communication over control connection, Communication over Data Connection, Anonymous FTP 6. WWW Architecture, WEB Documents 7. HTTP	6

References:

Computer Networks, Tanenbaum, ISBN:788177581652, Pearson

2. Data Communication and Networking by BehrouzForouzan, TATA McGraw Hill.Fourth edition

3. Computer Networking and the Internet,Halsall / Kulkarni, ISBN:9788177584752, Pearson

4. Data Communications and Networks: An Engineering Approach, Irvine, Wiley India, ISBN:9788126507658

5. Elements of Network Protocol Design, Gouda, ISBN:9788126516476, Wiley India

6. Computer Networks-A Systems Approach, 5e , Peterson, ISBN :9789380501932, Elsevier

5) C#.NET -II

Total lectures: 30 Credits: 02 Sem-IV

Syllabus

C#.NET -II		
No	**Topic**	**Lectures**
1	**Data Access** 1. File System Data 2. XML 3. Databases and ADO.NET 4. Data Binding	6
2	**Web Programming** 1. Basic Web programming 2. Advanced Web programming 3. Web Services 4. Deployment Web applications	6
3	**.NET Assemblies** 1. Components 2. .NET Assembly features 3. Structure of Assemblies 4. Calling assemblies, private and shared assemblies	6
4	**Networking** 1. Networking overview 2. Networking programming options Webclient WebRequest and WebResponse TcpListener&TcpClient	8
5	**Introduction to GDI+** 1. Overview of Graphical Drawing 2. Pen Class, Brush Class, Font Class 3. Using Images 4. Clipping, Drawing2D, Imaging	4

References:

Beginning Visual C#, Wrox Publication
Professional Visual C#, Wrox Publication
Inside C#, by Tom Archer ISBN: 0735612889 Microsoft Press Â© 2001, 403 pages
Beginning ASP.NET 3.5, Wrox Publication
Programming ASP.NET 3.5 by Jesse Liberty, Dan Maharry, Dan Hurwitz, O'Reilly
Illustrated C# 2008, Solis, Publication APRESS, ISBN 978-81-8128-958-2
Professional C# 4.0 and .NET 4by Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson, Morgan Skinner, WROX
Beginning C# Object-Oriented Programming By Dan Clark ,Apress
ADO.NET Examples and Best Practices for C# Programmers, By Peter D. Blackburn Apress
Database Programming with C#, By Carsten Thomsen, Apress