**SGGS INSTITUTE OF ENGINEERING AND TECHNOLOGY**
**VISHNUPURI- NANDED**

# DEPARTMENT OF INFORMATION TECHNOLOGY

**REVISED SYLLABI STRUCTURE OF THIRD YEAR**
**(w.e.f July 2011)**

| Code | Name of the course | Credits | Lectures /week | Practicals/ week |
|---|---|---|---|---|
| **IT-301** | Theory of Computation | 03 | 03 | -- |
| **IT-302** | Software Engineering | 04 | 03 | 02 |
| **IT-303** | Advanced Java | 04 | 03 | 02 |
| **IT-304** | Operating System | 04 | 03 | 02 |
| **IT-305** | Data Base Management System | 04 | 03 | 02 |
| **IT-306** | Computer Laboratory. – III | 01 | -- | 02 |
| | | | | |
| **Total for Part-I** | | **20** | **15** | **10** |
| **IT-307** | Computer Algorithms | 04 | 03 | 02 |
| **IT-308** | Coding Theory | 03 | 03 | -- |
| **IT-309** | TCP/IP | 04 | 03 | 02 |
| **IT-310** | Digital Signal Processing | 04 | 03 | 02 |
| **IT-311** | Computer Organization | 03 | 03 | -- |
| **IT-312** | Computer Laboratory – IV | 01 | -- | 02 |
| **IT-313** | Seminar | 01 | -- | 02 |
| **Total for Part-II** | | **20** | **15** | |
| **Total for Part-I and Part-II** | | **40** | **30** | **20** |

SEMESTER I

## IT-301: THEORY OF COMPUTATION

(Total Credits:03, Lectures/Week:03 Hours, Practical's/Week:00 Hours)

1. Finite Automata and regular Expressions**:** Finite state systems, NFA, Finite Automata with ϵ move, finite automata with output, applications
2. Context Free Grammars and Pushdown Automata: Derivation trees, Chomsky normal form, Greibach normal form, Pushdown automata, context free languages and properties of context free languages.
3. Turing Machines and Undecidability: Model, techniques for Turing machine construction, Church's hypothesis, Turing machine as enumerators, properties of enumerable languages, Rice's theorem, undecidability of Post's correspondence problem, Greibach theorem.
4. The Chomsky Hierachy and deterministic Context-Free Languages
5. Regular and unrestricted grammars, context sensitive languages, relations between classes of languages, normal forms for DPDA's, closure of DCFL's under complementation, additional closure and decision properties of DCFL's, LR (k) Grammers, closure properties of families of languages.
6. Computational Complexity Theory: Hierarchy theorems, relations among complexity measures, properties of general complexity measures, Axiomatic complexity theory.

**References:**


1. "Introduction to Computer Theory", by Daniel I. A. Cohen, 2nd edition, (October 1996), John Wiley & Sons.
2. "Introduction to Automata Theory, Languages, and Computation", by John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman,2nd edition, (November 14, 2000), Addison-Wesley.
3. "Automata and Computability (Undergraduate Texts in Computer Science) by Dexter C. Kozen,, (April 1997), Springer Verlag
4. "Theory of Computer Science", by E.V. Krishnamurthy , EWP.
5. "Introduction to Language and Theory of Computation", by John Martin, McGraw Hill


## IT-302: SOFTWARE ENGINEERING

(Total Credits:04, Lectures/Week:03 Hours, Practical's/Week:02 Hours)

1. **Introduction To Software Engineering :**Nature of Software, Software Process, Software Engineering Practice, Software Myths, Generic Process model, Process Models: Waterfall Model, Incremental Models, Evolutionary Models, Concurrent, Specialized Process Models, Personal and Team Process Models, Agile Process models: Agile process, Extreme programming
2. **Requirements Engineering :**Requirements Engineering, Initiating the process, Eliciting Requirements, Building the Requirements Model, Negotiating, Validating requirements, Requirements Analysis, Scenario-Based Analysis, Requirements Modeling strategies, Flow-Oriented Modeling, Class based modeling, **SRS.**
3. **Design Engineering :**Design Process, Design Concepts, The Design Model: Data Design, Architectural, interface Design Elements.
4. **Architectural Design:** Software Architecture, Architectural Styles, Architectural Design, User Interface Design: Rules, User Interface Analysis and Design, Applying Interface Design Steps, Issues, Web App Interface Design Principles
5. **Testing Strategies :**A Strategic approach to Software Testing, Strategic Issues, Testing Strategy for Conventional Software and Object-Oriented Software, Testing strategies for Web App, Validation Testing, System Testing, Validation and Verification, Debugging.
6. **Testing Tactics:** Testing Fundamentals, White Box Testing: Basis Path Testing, Control Structure Testing, Black Box Testing.
7. **Project management Concepts:**Management Spectrum, people, product, process, project, critical practices, Process and project Metrics: Metrics in process and project domains, software measurement metrics for software quality, Estimation for software project: project planning process, software scope and feasibility, resources, Decomposition Techniques, Empirical Estimation Models, Estimation Empirical, Estimation for Object Oriented project , Specialized Estimation techniques, Make by decision.
8. **Project Planning :**Risk Management: Reactive versus proactive Software Risk, Risk Identification, risk projection, risk refinement, risk mitigation, monitoring & management, The RMMM plan. Project Scheduling: Task set for Software project, defining a task network, scheduling, earned value analysis, Product Metrics: A framework for product metrics, Software Quality: Software Quality Factors,

9. **Software configuration management**: software configuration management, the SCM Repository, SCM process.

**Text Books:**


1. Pressman R., "Software Engineering, A Practitioners Approach", 7th Edition, Tata McGraw Hill Publication,2010, ISBN 978-007-126782-3
2. Mall R., "Fundamentals of Software Engineering", Second Edition, Prentice Hall India, 2004, ISBN 81 - 203-2445-52.
3. Vliet H., "Software Engineering Principles and Practices", Second Edition, John Wiley And Sons, ISBN 9971-51-357-9
4. Sommerville “Software Engineering” 8th Edition, Person Education
5. Behfarooz A:, Hudson F., "Software Engineering Fundamentals", Oxford University Press, 2002, ISBN 0-19-510539-7
6. “An Integrated Approach to Software Engineering”, Third Edition, Pankaj Jalote


**Term work :** Students will have to perform at least 10 practical in the subject . The practicals will be designed by the concerned teacher and should be based on the current trends and technology in the relevant subject. Teacher should also give some home assignment to the students . The evaluation of the student should be done continuously and based on his/her performance and attendance for the practical in the semester marks should be given at the end of the semester.

**Practical Examination :** Based on the above term work a practical examination will be conducted at the end of the semester as per the schedule provided by the controller of examination in the presence of an External Examiner. The practical examiantion will be conducted in the manner as described .

1. Student will have to perform atleast one experiement from amongst the practicals Performed in the laboratory or amongst experiements designed by the internal faculty for the concerned subject.
2. Oral examination which will based on the syllabus of the concerned subject.
3. Practical examination will be of three hours duration.

## IT-303: ADVANCE JAVA

(Total Credits:04, Lectures/Week:03 Hours, Practical’s/Week:02 Hours)

1. **Collections :** Collection Interfaces, Concrete Collections, The Collections Framework
2. **Multithreading :** Creating thread and running it, Multiple Thread acting on single object, Synchronization, Thread communication, Thread group, Thread priorities, Daemon Thread, Life Cycle of Thread
3. **Networking :**Internet Addressing, InetAddress, Factory Methods, Instance Methods, TCP/IP Client Sockets, URL, URL Connection, TCP/IP Server Sockets, Datagrams
4. **Enterprise Java Bean :**Preparing a Class to be a JavaBean, Creating a JavaBean, JavaBean Properties, Types of beans, Stateful Session bean, Stateless Session bean, Entity bean
5. **Java Database Connectivity (JDBC):**Merging Data from Multiple Tables: Joining, Manipulating Databases with JDBC, Prepared Statements, Transaction Processing, Stored Procedures **C**
6. **Servlets:** Servlet Overview and Architecture, Interface Servlet and the Servlet Life Cycle, Handling HTTP get Requests, Handling HTTP post Requests, Redirecting Requests to Other Resources, Session Tracking, Cookies, Session Tracking with HttpSession
7. **JavaServer Pages (JSP):**Introduction, JavaServer Pages Overview, A First JavaServer Page Example, Implicit Objects, Scripting, Standard Actions, Directives, Custom Tag Libraries
8. **Remote Method Invocation:**Defining the Remote Interface, Implementing the Remote Interface, Compiling and Executing the Server and the Client
9. **Common Object Request Broker Architecture (CORBA):**Technical/Architectural Overview, CORBA Basics, CORBA services
10. **Introduction Smart Phone Application Development:** Introduction to android platform, Creating application template, adding activity, intent, services to application, using Google map API

**Reference Book:**


1. “Advanced Java 2 Platform HOW TO PROGRAM” by H. M. Deitel, P. J. Deitel, S. E. Santry - Prentice Hall

**2.** "Beginning Java™ EE 6 Platform with GlassFish 3 From Novice to Professional" by Antonio Goncalves – Apress publication

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**Practical Examination :** Based on the above term work a practical examination will be conducted at the end of the semester as per the schedule provided by the controller of examination in the presence of an External Examiner. The practical examination will be conducted in the manner as described .

1. Student will have to perform at least one experiment from amongst the practicals Performed in the laboratory or amongst experiments designed by the internal faculty for the concerned subject.
2. Oral examination which will based on the syllabus of the concerned subject.
3. Practical examination will be of three hours duration.

**IT-304: OPERATING SYSTEMS(With Linux case study)**

(Total Credits:04, Lectures/Week:03 Hours, Practical's/Week:02 Hours)

**PART I: INTRODUCTION**

Architecture of OS, Operating system objectives and functions, Interaction of O. S. & hardware architecture, Evolution of operating systems, Batch, multiprogramming. Multitasking, Multiuser, parallel, distributed & real -time O.S. ,System calls, O. S. Shell, Linux Shell commands , Shell programming.

**PART II: PROCESS MANAGEMENT**

Process States, Process Description, Process Control, Threads, Processes and Threads, Uni processor Scheduling: Types of scheduling, Scheduling algorithms, LINUX scheduling,Linux Processes and Thread Management

Concurrency: Mutual Exclusion and Synchronization. Principles of Concurrency, Mutual Exclusion: Hardware/Software Approaches, Semaphores, Monitors.
Deadlock: Principles of Deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection,

**PART III: MEMORY MANAGEMENT**

Memory Management: Memory management Requirements, Memory partitioning, Paging, Segmentation,
Virtual Memory: Operating System Software,
LINUX Memory Management: Paging.

**PART IV: SCHEDULING**

Uniprocessor scheduling: Types of Scheduling, Scheduling Algorithms,
Multiprocessor and real time scheduling: Multiprocessor scheduling, Real time Scheduling

**PART V: INPUT/ OUTPUT AND FILES**

I/O Management and Disk Scheduling: I/O Devices, Organization of the I/O Function, Operating System Design Issues, LINUX I/O System.
File Management: Overview, File Organization, File Directories, File sharing, LINUX File System.

**Reference Books:**

1.Operating Systems, Andrew S. Tenenbaum, PHI
2.Silberschatz, Galvin, Gagne: Operating System Concepts, 7th Edition,Wiley
3.Operating Systems: Internals and Design Principles, William Stalling, PHI.

**Term work :** Students will have to perform at least 10 practical in the subject . The practicals will be designed by the concerned teacher and should be based on the current trends and technology in the relevant subject. Teacher should also give some home assignment to the students . The evaluation of the student should be done continuously and based on his/her performance and attendance for the practical in the semester marks should be given at the end of the semester.

**Practical Examination :** Based on the above term work a practical examination will be conducted at the end of the semester as per the schedule provided by the controller of examination in the presence of an External Examiner. The practical examination will be conducted in the manner as described .

1. Student will have to perform at least one experiment from amongst the practicals Performed in the laboratory or amongst experiments designed by the internal faculty for the concerned subject.
2. Oral examination which will based on the syllabus of the concerned subject.
3. Practical examination will be of three hours duration.

## IT-305: DATABASE MANAGEMENT SYSTEM

(Total Credits:04, Lectures/Week:03 Hours, Practical's/Week:02 Hours)

1. **Introduction**: Purpose of database systems, view of data, data models, database languages, transaction management, storage management, database administrator, database users, overall system structure.
2. **Entity-Relationship Model:** Basic concepts, design issues, mapping constraints, keys, E-R diagram, weak entity sets, extended E-R features, design of an E-R database schema, reduction of an E-R schema to tables.
3. **Relational Model:** Structure of relational databases, the relational algebra, the tuple relational calculus, the domain relational calculus, extended relational algebra operations, modifications of the database, views. Study of SQL, embedded SQL, and other SQL features.
4. **Relational Database Design:** Integrity Constraints, Domain constraints, referential integrity, assertions, triggers, functional dependencies. Pitfalls in relational database design, decomposition, normalization using functional dependencies, multi valued dependencies, join dependencies, domain key normal form, alternative approaches to database design.
5. **Storage and File Structure:** Magnetic disks, RAID, Tertiary storage, File organization, organization of records in files, data dictionary storage, storage structures for object oriented databases
6. **Indexing and Hashing:** Basic concepts, ordered indices, B+ tree index files, B tree index files, static hashing, dynamic hashing, comparison of ordered indexing and hashing, index definition in SQL, multiple key access.
7. **Query Processing:** Overviews, cost estimation, measures of query cost, selection operation, sorting, join operation and join strategies, evaluation of expressions.
8. **Transaction and Concurrency Control:** Transaction concept, transaction state, atomicity and durability, concurrent executions, serializability, recoverability, isolation, transaction definition in SQL, testing for serializability. Concurrency control, lock based protocols, time stamp based protocols, validation based protocols, multiple granularity, multiinversion schemes, deadlock handling, insert and delete operations, concurrency in index structures.
9. **Recovery System:** Failure classification, storage structure, recovery and atomicity. Log based recovery, shadow paging, recovery with concurrent transactions, buffer management
10. **Database system Architectures:** Centralized systems, client-server systems, parallel systems, distributed systems, network types
11. **Term Work:A**pplication development using ORACLE or Microsoft SQL Server or MySQL or using PHP or VC++ or JAVA as front-end processor.

**Reference Books:**


1. Silberschatz, Korth and Sudarshan, "Database system Concepts", McGraw Hill.
2. Aho Ullman, "Principles of Database Management"
3. G. Everest, "Database Management", McGraw Hill.
4. C.J. Date, "An Introduction to database Concepts".


**Term work :** Students will have to perform at least 10 practical in the subject . The practicals will be designed by the concerned teacher and should be based on the current trends and technology in the relevant subject. Teacher should also give some home assignment to the students . The evaluation of the student should be done continuously and based on his/her performance and attendance for the practical in the semester marks should be given at the end of the semester.

**Practical Examination :** Based on the above term work a practical examination will be conducted at the end of the semester as per the schedule provided by the controller of examination in the presence of an External Examiner. The practical examination will be conducted in the manner as described .

1. Student will have to perform at least one experiment from amongst the practicals Performed in the laboratory or amongst experiments designed by the internal faculty for the concerned subject.
2. Oral examination which will based on the syllabus of the concerned subject.
3. Practical examination will be of three hours duration.

**IT-306: COMPUTER LABORATORY-III**

12. (Total Credits:01, Lectures/Week:00Hours, Practical's/Week:02 Hours)

**PHP AND MYSQL**

**Part I: PHP:**Introduction to PHP, Adding PHP to HTML, PHP Syntax and variables, control and functions, passing information between pages, String and arrays in PHP, Number handling with PHP.
**Part II: MySql:**MySql administration with PhpMyAdmin, MySql Functions,Displaying queries in tables, Building forms from queries.

Part III: Sessions, Cookies and HTTP with PHP/MySql.
Students should perform minimum 20 experiments based on above syllabus and should submit a mini web application as project in CL-III.

**Reference Book**

1. "PHP5 and MySQL bible" by Tim Converse, Joyce Park, Wiley Pub, 2010.

**Term work :** Students will have to perform at least 10 practical in the subject . The practicals will be designed by the concerned teacher and should be based on the current trends and technology in the relevant subject. Teacher should also give some home assignment to the students . The evaluation of the student should be done continuously and based on his/her performance and attendance for the practical in the semester marks should be given at the end of the semester.

**Practical Examination :** Based on the above term work a practical examination will be conducted at the end of the semester as per the schedule provided by the controller of examination in the presence of an External Examiner. The practical examination will be conducted in the manner as described .

1. Student will have to perform at least one experiment from amongst the practicals Performed in the laboratory or amongst experiments designed by the internal faculty for the concerned subject.
2. Oral examination which will based on the syllabus of the concerned subject.
3. Practical examination will be of three hours duration.

SEMESTER-II

**IT-307: COMPUTER ALGORITHMS**

(Total Credits:04, Lectures/Week:03 Hours, Practical's/Week:02 Hours)

1. **Introduction**: What is an algorithm, algorithm specification, performance analysis, randomized algorithms, and overview of stacks, queues, trees and graphs, Dictionaries, Priority queues, sets and disjoint set union.
2. **Divide and Conquer**: General method, binary search, finding the maximum and minimum, merge sort, quick sort, selection and Strassan's matrix multiplication.
3. **The Greedy Method**: The General Method, knapsack problem, tree vertex splitting, job sequencing with deadlines, minimum cost spanning trees, optimal merge patterns, optimal storage on tapes, single source shortest paths
4. **Dynamic Programming**: The General Method, multistage graphs, all pair's shortest paths with general weights, optimal binary search trees, string editing, 0/1 knapsack, the traveling salesperson problem, flow shop scheduling.
5. **Basic Traversals and Search Techniques**: Techniques for binary trees, techniques for graphs, connected components and spanning trees, disconnected components and DFS.

6. **Backtracking**: The general method, the 8-queens problem, sum of subsets, graphs coloring, Hamiltonian cycles, and knapsack problem.
7. **Branch and Bound**: The method, 0/1 knapsack problem. Traveling salesperson problem, efficiency considerations.
8. **Algebraic problems**: The general method, evaluation and interpolation, the fast Fourier transform, modular arithmetic, even faster evaluation and interpolation.
9. **Lower Bound Theory**: Comparison trees, oracles and adversary arguments, lower bounds through reductions, techniques for algebraic problems
10. **NP-Hard and NP-Complete Problems**: Basic concepts, Cook's theorem, NP-Hard graph problems, NP-Hard scheduling problems, and NP-Hard code generation problems.

**Term work :** Students will have to perform at least 10 practical in the subject . The practicals will be designed by the concerned teacher and should be based on the current trends and technology in the relevant subject. Teacher should also give some home assignment to the students . The evaluation of the student should be done continuously and based on his/her performance and attendance for the practical in the semester marks should be given at the end of the semester.

**Practical Examination :** Based on the above term work a practical examination will be conducted at the end of the semester as per the schedule provided by the controller of examination in the presence of an External Examiner. The practical examination will be conducted in the manner as described .

1. Student will have to perform at least one experiment from amongst the practicals Performed in the laboratory or amongst experiments designed by the internal faculty for the concerned subject.
2. Oral examination which will based on the syllabus of the concerned subject.
3. Practical examination will be of three hours duration.

**Reference Books:**


1. Horowitz, Sahni and Rajasekaran, "Fundamentals of Computer Algorithms", Galgotia Publications.
2. Cormen, Leiserson and Rivest, " Introduction to Algorithms", PHI.
3. Heileman, "Data Structures, Algorithmms and Object Oriented Programming", MCGraw Hill.


## IT-308: CODING THEORY

(Total Credits:03, Lectures/Week:03 Hours, Practical's/Week:00 Hours)

1. **Source Coding**: Definition and Examples, Uniquely decodable codes, Instantaneous codes, Constructing Instantaneous codes, Kraft's Inequality, McMillan's Inequality.
2. **Optimal Codes**: Optimality, Binary Huffman Codes, Average word length of Huffman codes, r-ary Huffman codes, Extensions of sources.
3. **Entropy:** Information and Entropy, Properties of entropy function, Entropy and average word length, Shannon fano coding, entropy of extensions and products, Shannon's first theorem, Example of Shannon's first theorem.
4. **Information Channels**: Notations and definitions, Binary symmetric channel, System entropies, Mutual Information, Channel Capacity.
5. **Using an unreliable channel**: Decision rules, Example of improved reliability, Hamming distance, proof of Shannon's theorem, Converse of Shannon's theorem.
6. **Error correcting codes**: Introductory concepts, Examples of codes, Minimum distance, Hamming's sphere packing Bound, The Gilbert-Varshamov Bound, Hadamard Matrices and codes.
7. **Linear codes**: Matrix description of Linear codes, Equivalence of Linear codes, Minimum distance of linear codes, Hamming codes, Golay codes, Standard array, Syndrome decoding.

**Text Book:**


Information and coding theory, Gareth Jones and J.Mary Jones, Springer Publication.


## IT-309: TCP/IP

(Total Credits:04, Lectures/Week:03 Hours, Practical's/Week:02 Hours)

1. ***Introduction and Underlying Technologies :*** Introduction History, Protocols and Standards, Standards organization, Internet standards, Internet Organizations. The OSI Model and the TCP/IP Protocol Suite OSI Model, Layers in the OSI Model, TCP/IP Protocol suite, Addressing, TCP/IP Versions, Underlying Technologies LANs, P2P WANS, Switched WANs, Connecting Devices

2. ***Network Layer:*** Introduction to Network Layer, Introduction, Classful addressing, other issues, subnetting, supernetting, classless addressing, Delivery and Forwarding of IP Packets Direct vs indirect delivery, routing methods, static vs dynamic routing, routing table and routing module, CIDR. Internet Protocol Version 4 (Ipv4) Datagram, Fragmentation, Options, Checksum, IP Package, Address Resolution Protocol (ARP) ARP, ARP Package, RARP, Internet Control Message Protocol Version 4 (ICMPv4) message format, Error reporting, Query, Checksum. Unicast Routing Protocols (RIP, OSPF, and BGP) ,Intra and inter domain routing, distance vector routing, RIP, Link state routing, OSPF, path vector routing, BGP.
3. ***Transport Layer:*** User Datagram Protocol (UDP) process to process communication, user datagram, checksum, udp operation, use of udp. Transmission Control Protocol (TCP) tcp services, tcp features, segment, a tcp connection, state transition diagram, flow control, error control, congestion control, tcp timers, options.
4. ***Application Layer:*** Domain Name System (DNS) , Name space, domain name space, distribution of name space, DNS in Internet, resolution, DNS messages, types of records, compression, DDNS, encapsulation. World Wide Web and HTTP Architecture, web documents, HTTP.

***Text Book:***

**1.** TCP/IP Protocol suite by Behrouz A. Forouzan, 4/e, TMH.

**2.** Internetworking with TCP/IP – Principles, protocols and Architecture, by Douglous Comer, Prentice Hall.

**Term work :** Students will have to perform at least 10 practical in the subject . The practicals will be designed by the concerned teacher and should be based on the current trends and technology in the relevant subject. Teacher should also give some home assignment to the students . The evaluation of the student should be done continuously and based on his/her performance and attendance for the practical in the semester marks should be given at the end of the semester.

**Practical Examination :** Based on the above term work a practical examination will be conducted at the end of the semester as per the schedule provided by the controller of examination in the presence of an External Examiner. The practical examination will be conducted in the manner as described .

1. Student will have to perform at least one experiment from amongst the practicals Performed in the laboratory or amongst experiments designed by the internal faculty for the concerned subject.
2. Oral examination which will based on the syllabus of the concerned subject.
3. Practical examination will be of three hours duration.

## IT-310 : DIGITAL SIGNAL PROCESSING

(Total Credits:04, Lectures/Week:03 Hours, Practical's/Week:02 Hours)

1. **Introduction:** Signals, systems and signal processing, Classification of signals, examples of typical signals, signals processing applications, why DSP? A to D and D to A conversion.
2. **Discrete - Time Signals and Systems:** Discrete time signals, Discrete time systems, Analysis of discrete time (LTI) systems, Implementation of discrete time systems and Correlation of discrete time signals.
3. **Transforms:** Z and inverse Z transform and its application to the analysis of LTI systems, DTFT, DFT and their properties.
4. **Efficient computation of DFT:** Direct computation of DFT, Divide and conquer approach for computation of DFT, FFT – decimation in time (DIT) and decimation in frequency (DIF) techniques.
5. **Digital filters - IIR:** Impulse invariant and Bilinear transformation, Butterworth and Chebyshev filter design of Low pass filter. Frequency transformation to design high pass, band pass and band stop filters.
6. **Digital filters - FIR:** Window based design of low pass, high pass, band pass and band stop filters using Rectangular, Hamming, Hanning, Bartlett, Blackman and Kaiser Window.
7. **Other transforms:** DCT, Walsh, Hadamard, Hotelling (KL), Short Time Fourier transform and introduction to Wavelet transform.

**SUGGESTED BOOKS**


1. J. G. Proakis, D. G. Manolakis, "***Digital Signal Processing- Principles, Algorithms and Applications"*** – PHI Publications, 4th Edition
2. Johnny R. Johnson, ***"Introduction to Digital Signal Processing"*** – PHI Publications
3. R. C. Gonzalez and R. E. Woods, ***"Fundamentals of Digital Signal Processing"*** – Addison Wesley Publications
4. Oppenheim, R. Schafer and R. Buck, ***"Discrete Time Signal Processing"*** – Pearson Education, India
5. Bansal, Goel and Sharma, ***"MATLAB and its applications in Engineering"*** – Pearson Education
6. S. K. Mitra, "***Digital signal Processing, A Computer Based Approach***" – TMH, 2001

**Term work :** Students will have to perform at least 10 practical in the subject . The practicals will be designed by the concerned teacher and should be based on the current trends and technology in the relevant subject. Teacher should also give some home assignment to the students . The evaluation of the student should be done continuously and based on his/her performance and attendance for the practical in the semester marks should be given at the end of the semester.

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1. Student will have to perform at least one experiment from amongst the practicals Performed in the laboratory or amongst experiments designed by the internal faculty for the concerned subject.
2. Oral examination which will based on the syllabus of the concerned subject.
3. Practical examination will be of three hours duration.

## IT-311 : COMPUTER ORGANIZATION

(Total Credits:03, Lectures/Week:03 Hours, Practicals/Week:00 Hours)

1. **Introduction to Computer Systems** :Historical Background , Architectural Development and Styles ,Technological Development, Performance Measures
2. **Instruction Set Architecture and Design** :Memory Locations and Operations, Addressing Modes , Instruction Types, Programming Examples
3. **Computer Arithmetic** :Number Systems, Integer Arithmetic, Floating-Point Arithmetic
4. **Processing Unit Design** :CPU Basics, Register Set, Datapath, CPU Instruction Cycle, Control Unit
5. **Memory System Design I** :Basic Concepts ,Cache Memory
6. **Memory System Design II :**Main Memory, Virtual Memory, Read-Only Memory
7. **Input– Output Design and Organization :**Basic Concepts, Programmed I/O, Interrupt-Driven I/O, Direct Memory Access (DMA), Buses, Input –Output Interfaces
8. **Pipeline Design Techniques:** General Concepts, Instruction Pipeline, Example of Pipeline processors, Instruction Level Parallelism, Arithmetic Pipeline

**Text Book:**

Fundamentals of Computer Organization and Architecture, MOSTAFA ABD-EL BARR Willy Publications

**Reference Books:**

1. Computer Architecture and Organization, John P. Haze, McGraw Hill.
2. Computer Organization, Haze and Zaky, TMH.
3. Computer Organization and Architecture, William Stalling, PHI.

## IT-312 : COMPUTER LABORATORY - IV

(Total Credits:01, Lectures/Week:00 Hours, Practicals/Week:02 Hours)

**ASP.NET with VB.NET Or C#.NET**

1.Building ASP.NET pages ,Designing ASP.NET websites, Performing Data access ,Building components, Site navigation, Implementing Security with ASP.NET,Building ASP.NET applications, ASP.NET with AJAX

**Reference Books:**

“ASP.NET 4 Unleashed” by Stephen Walter, Kevin Hoffman, SAMS Publication.

**Term work :** Students will have to perform minimum 20 practical in the subject . The practicals will be designed by the concerned teacher and should be based on the current trends and technology in the relevant subject. Teacher should also give some home assignment to the students . The evaluation of the student should be done continuously and based on his/her performance and attendance for the practical in the semester marks should be given at the end of the semester.

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1. Student will have to perform at least one experiment from amongst the practicals Performed in the laboratory or amongst experiments designed by the internal faculty for the concerned subject.
2. Oral examination which will based on the syllabus of the concerned subject.
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## IT-313 : SEMINAR

(Total Credits:01, Lectures/Week:00 Hours, Practicals/Week:02 Hours)

Seminar work shall be in the form of report to be submitted by the student at the end of the semester. Students should select a topic in Information Technology looking towards the current trend in this area and to be decided by the students and the teacher concerned. The candidate will deliver a talk on the topic selected for half an hour and assessment will be made by the Internal Examiner or Guide appointed by the Principal of the college.