COURSE STRUCTURE AND DETAILED SYLLABUS

for

II B.TECH

INFORMATION TECHNOLOGY

(Applicable for the batches admitted from 2016-17)

GURU NANAK INSTITUTIONS
TECHNICAL CAMPUS
(An Autonomous Institution)
Campus: Ibrahimpatnam, R.R. District – 501 506

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

CONTENTS

II YEAR I SEMESTER

II YEAR II SEMESTER

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS
(AUTONOMOUS)

COURSE STRUCTURE

II. B. Tech. Information Technology

II YEAR - I SEMESTER

S.No	Code	Group	Subject	L	T	P	Credits
1	IT0321	PC	Mathematical Foundations of Computer Science	3	2	0	3
2	IT0322	PC	Unix and Shell Programming	3	1	0	3
3	EC0343	ES	Digital Logic Design & Micro Processor	4	1	0	4
4	IT0323	PC	Computer Organization and architecture	4	1	0	4
5	IT0324	PC	Advanced Data Structures through C++	4	1	0	4
6	GN0391	HS	Gender Sensitization Lab	-	-	-	-
7	IT0325	PC	Advanced Data Structures through C++ Lab	0	0	3	2
8	EC0326	ES	Digital Logic Design & Micro Processor Lab	0	0	3	2
9	IT0326	PC	Unix and Shell Programming Lab	0	0	3	2
			Total Credits				**24**

II YEAR - II SEMESTER

S.No	Code	Group	Subject	L	T	P	Credits
1	IT0421	PC	Java Programming	3	1	0	3
2	IT0422	PC	Data Base Management Systems	4	1	0	4
3	IT0423	PC	Operating Systems	4	1	0	4
4	HM0313	HS	Probability and Statics	4	1	0	3
5	IT0424	PC	Design and Analysis of Algorithm	4	1	0	4
6	IT0425	PC	Java Programming Lab	0	0	3	2
7	IT0426	PC	Operating Systems Lab	0	0	3	2
8	IT0427	PC	Data Base Management Systems Lab	0	0	3	2
9	GN0492	HS	Human Values and Professional Ethics	2	0	0	-
			Total Credits				**24**

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS
(AUTONOMOUS)

II Year B. Tech. IT I-Sem

L	T	P	C
3	2	0	3

(IT0321) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Syllabus:

UNIT-I: Mathematical Logic : Statements and notations, Connectives, Well formed formulas, Truth Tables, Tautology, Equivalence implication, Normal forms, Quantifiers, Universal quantifiers. Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, Proof of contradiction, Automatic Theorem Proving.

UNIT-II: **Relations**: Composition of Binary Relation and Partial Ordering Relations, Hasse Diagram. **Functions:** Inverse Function, Composition of Functions, Recursive Functions, Lattice and its Properties.
Algebraic Structures: Algebraic Systems Examples and General Properties, Semi Groups and Monoids, Groups, Sub Groups and Homomorphism.

UNIT-III: **Combinatorics:** Basis of counting, Combinations & Permutations, With repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, The principles of Inclusion – Exclusion, Pigeon- hole principles and its applications.

UNIT-IV: **Graphs** – Basic concepts, Isomorphism's and sub graphs, Trees and their properties, Spanning trees, Directed trees, Binary trees.
Planar graphs, Euler's Formula, Multigraphs and Euler's Circuits, Hamiltonian graphs, Chromatic Numbers

UNIT-V: **Recurrence Relations:** Generating Functions, Function of Sequences, Calculating Coefficient of generating function, Recurrence relations, solving recurrence relation by substitution and Generating functions, Characteristics roots solution, in homogeneous Recurrence Relation.

Text Books:

1. Discrete Mathematics for Computer Scientists and Mathematicians, J.L. Mott, A.Kandel, and T.P. Baker, 2nd Edition, Prentice Hall of India, 1986.
2. Discrete Mathematical Structures with Applications to Computer Science, J.P Tremblay and R. Manohar, Tata McGraw-Hill, 1997.

References:

1. Discrete and Combinatorial Mathematics- An appliedintroduction, Ralph P. Grimaldi and B.V.Ramana, 5th Edition,Pearson Education, 2006.
2. Discrete Mathematics and its Applications, Kenneth H.Rosen, 5th Edition, Tata McGraw-Hill, 2003.
3. Elements of Discrete mathematics- A computer oriented Approach, C.L. Liu and D.P. Mohapatra, 3 rd Edition, Tata Mcgraw-Hill, 2008.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS
(AUTONOMOUS)

II Year B. Tech. IT I-Sem

L	T	P	C
3	1	0	3

(IT0322) UNIX AND SHELL PROGRAMMING

Syllabus:

UNIT I: Introduction to Unix: Architecture of Unix, Features of Unix , Syntax of Unix Commands –Echo, Printf,script, passwd, uname, date, cal, man, Structure of man pages.

UNIT II: Unix Utilities: Introduction to UNIX file system, Hierarchical structure of file system, Contents of /etc directory, Absolute and Relative paths, Data Structures to manage files, Importance of umask and Default permissions, file creation using cat and vi editor, Concepts related to Hard links and
soft links, File attributes and Types of files, Changing the file attributes using chmod, chown, Significance of read, write and execute permissions on regular files and directories
for security.

UNIT III: Directory Related Commands: mkdir, rmdir, cd, cp, mv,Process utilities, ps, disk utilities, unlink, mount, umount, find and ulimit **Simple Filters:** Filters and Pipes, Concatenating files, Display
Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count characters, Words or Lines, Comparing Files using diff, comm, cmp commands.

UNIT IV: Filters using regular Expressions: Patterns**,** Regular expressions, Grep Family, Regular expressions supported by grep family, Searching based on Content. **AWK:** Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications.

UNIT V: Introduction to Shells : Unix Session, Types of Shells, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization.
Interactive Korn Shell: Korn Shell Features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, Options, Startup Scripts, Command History, Command Execution Process. **Korn Shell Programming:** Basic Script concepts, Expressions, Decisions:- Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script
Examples.

Text Books:

1. Unix and Shell Programming, Behrouz A. Forouzan and Richard F. Gilberg, Thomson Brooks/Cole Publishing, 2003.
2. Your UNIX the ultimate guide, Sumitabha Das, 3rd Edition, TMH, 2006.

References:

1. Unix for Programmers and Users, Graham Glass, King Ables, 3rd Edition, Pearson Education, 2003.
2. The UNIX Programming Environment, Brian W. Kernighan, Rob Pike, Prentice-Hall, 1984.
3. UNIX: The Complete Reference, Kenneth Rosen, Douglas
4. Host, Rachel Klee, Richard Rosinski, 2nd Edition, McGraw-Hill Professional, 2006.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS
(AUTONOMOUS)

II Year B. Tech. IT I-Sem

L	T	P	C
4	1	0	4

(EC0343) DIGITAL LOGIC DESIGN AND MICROPROCESSOR

Syllabus:

UNIT - I :Introduction to number systems: Common number systems and conversions, Operations in Binary,Octal and Hexa Decimal systems, Binary codes, code conversion, Basic of Boolean algebra , basic theorems and properties of Bollean algebra, canonical and standard form of Boolean functions, all digital logic gates-map method of minimization of 4 and 5 variable functions, Don't care map entries.

UNIT - II: NAND and NOR implementation: Design of Binary Adder, subtractor, Comparator, Decoders, Encoders, Multiplexers, DE multiplexers using gates. Introduction to sequential circuits, Latches, Flip-flops-SR,JK,JK master slave,D and T type flipflops,Truth tables and excitation tables, conversion of flipflops form.

UNIT -III : Concept of Shift register, Operation of Shift register, its configuration, Operation of Asynchronous Counters, Design of Synchronous modulo N- Counters, Design and Operation of Ring and Twisted Ring counters, Types of memories, Memory architecture-Memory array, Row Decoder, Column Decoder, RAM, ROM.

UNIT–IV:8086 ARCHITECTURE: Functional diagram, Register Organization, Memory Segmentation, Programming Model, Memory addressing, Physical memory organization, signal descriptions of 8086, Interrupts of 8086.

UNIT-V: INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMING OF 8086: Instruction formats, addressing modes, instruction set, simple programs involving logical, branch and call instructions, sorting, string manipulations.

Text Books:

1. Switching Theory And Logic Design-A.Anand Kumar PHI,2013
2. Advanced Microprocessor & Peripherals-A.K.Ray, K.M.Bhurchandi, TMH, 2nd Edition

References:

1. Digital Design-Third Edition ,M.Morris Mano,pearson Education/PHI
2. Switching And Finite AutomaticTheory-Zvi Kohavi,Niraj K.Jha Cambridge, 3rd Edition
3. Microprocessor And Interfacing-Douglas V.Hall,TMGH,2nd Edition

II Year B. Tech. IT I-Sem

L	T	P	C
4	1	0	4

(IT0323) COMPUTER ORGANIZATION AND ARCHITECTURE

Syllabus:

UNIT-I: BASIC STRUCTURE OF COMPUTERS: Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Computer Generations. Data Representation: Binary Numbers, Fixed Point Representation. Floating – Point Representation. Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes.

UNIT-II: REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS: Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit. BASIC COMPUTER ORGANIZATION AND DESIGN : Instruction codes, Computer Register Computer instructions, Timing and control, Instruction cycle, Memory – Reference Instructions. Input – Output and Interrupt, Design of basic computer, Design of Accumulator Logic.

UNIT-III: COMPUTER ARITHMETIC: Algorithms for fixed point and floating point addition, subtraction, multiplication and division operations. Hardware Implementation of arithmetic and logic operations, High performance arithmetic. Instruction Set & Addressing: Memory Locations and Addresses, Machine addresses and sequencing, Various Addressing Modes, Instruction Formats, Basic Machine Instructions. IA-32 Pentium example.

UNIT-IV: Processor Organization: Introduction to CPU, Register Transfers, Execution of Instructions, Multiple Bus Organization, Hardwired Control, Microprogrammed Control Memory Organization: Concept of Memory, RAM, ROM memories, memory hierarchy, cache memories, virtual memory, secondary storage, memory management requirements.

UNIT-V: INPUT-OUTPUT ORGANIZATION: Introduction to I/O, Interrupts-Hardware, Enabling and disabling Interrupts, Device Control, Direct memory access, buses, interface circuits, standard I/O Interfaces

Text Books:

1. Computer System Architecture – M. Moris Mano, Third Edition, Pearson/PHI.

References:

1. Computer Organization – Car Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.
2. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.
3. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson.

II Year B. Tech. IT I-Sem

L	T	P	C
4	1	0	4

(IT0324) ADVANCED DATA STRUCTURES THROUGH C++

Syllabus:

UNIT-I:C++ Class Overview-Basic OOP concepts, Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and Destructors, parameter passing methods, Inline functions, static class members, this pointer, Friend functions, Dynamic memory allocation and de-allocation (new and delete), Exception handling.Function Overloading, Operator Overloading, Generic Programming-Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.

UNIT-II: Algorithms, performance analysis, Time complexity and Space complexity, Review of basic data structures-The list ADT, Stack ADT, Queue ADT, array and linked list Implementations using template classes in C++. Tree-Basic Terminology, Binary tree ADT, array and linked representations, traversals, Threaded binary trees.

UNIT-III: Dictionaries, linear list representation, skip list representation, operations insertion, deletion and searching, Hashing-hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing extensible hashing comparison of hashing and skip lists. Priority Queues-Definition, ADT, Realizing a Priority Queue using Heap-Definition, Insertion, Deletion, Heap Sort, External Sorting-Model for external sorting, Multiway merge, Polyphase merge.

UNIT-IV: Search Tress (Part- 1): Binary Search Trees, Definition, ADT, Implementation, Operations-Searching, Insertion and Deletion, AVL Tree-Definition, Operations-Insertion and Searching. Search trees (Part-II): B-Tree Definition, B-Tree of order m, insertion, deletion and searching, Comparison of Search Trees. Graphs-Basic terminology, representations of Graphs, Graph search methods –DFS, BFS.

UNIT-V: Text Processing: Pattern matching algorithms-Brute Force, the Knuth-Morris-Pratt algorithm, Tries, Standard Tries, Compressed Tries, Suffix Tries.

Text Books:

1. Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd.,
Second Edition.
2. Data Structures, Algorithms and Applications in C++, S.Sahni, University Press (India)
Pvt.Ltd, Second edition, Universities Press Orient Longman Pvt. Ltd.

References:

1. Data Structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and .Mount, Wiley
Student Edition, John Wiley and Sons.
2. Data Structures and Algorithms in C++, Third Edition, Adam Drozdek, Thomson
3. Data Structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Advanced Data Structures and Algorithms in C++, V.V. Muniswamy Jaaico Publishing House.

II Year B. Tech. IT I-Sem

L	T	P	C
-	-	-	-

(GN0391) Gender Sensitization Lab

Unit –I

Understanding Gender: unit -**1,2**
Gender: Why Should We Study It? (*Towards a World of Equals*: Unit -1)
Socialization: Making Women, Making Men **(*Towards a World of Equals*: Unit -2)**
Introduction. Preparing for Womanhood. Growing up Male. First lessons in Caste. Different Masculinities.

Unit –II

Gender And Biology: Unit **4,10**
Missing Women: Sex Selection and Its Consequences (*Towards a World of Equals*: Unit -4)
Declining Sex Ratio. Demographic Consequences.
Gender Spectrum: Beyond the Binary (*Towards a World of Equals*: Unit -10)
Two or Many? Struggles with Discrimination.

Unit –III

Gender And Labour: Unit **3, 7**
Housework: the Invisible Labour (*Towards a World of Equals*: Unit -3)
"My Mother doesn't Work." "Share the Load."
Women's Work:Its Politics and Economics (*Towards a World of Equals*:Unit -7)
Fact and Fiction. Unrecognized and Unaccounted work. Additional Reading: Wages and Conditions of Work.

Unit –IV

Issues of Violence: Unit **6, 8, 11**
Sexual Harassment: Say No! (*Towards a World of Equals*: Unit -6)
Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: "*Chupulu".*
Domestic Violence: Speaking Out (*Towards a World of Equals*: Unit -8) Is Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Additional Reading: New Forums for Justice.
Thinking about Sexual Violence (*Towards a World of Equals*: Unit -11) Blaming the Victim-"I Fought for my Life…." - Additional Reading: The Caste Face of Violence.

Unit –V

Gender: Co-Existence unit -**12**
Just Relationships: Being Together as Equals (*Towards a World of Equals*: Unit -12)
Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Additional Reading: Rosa Parks-The Brave Heart.

II Year B. Tech. IT I-Sem

L	T	P	C
0	0	3	2

(IT0325) Advanced Data Structure through C++ Lab

Syllabus:

Week 1: Write C++ programs to implement the following using an array. a) Stack ADT b) Queue ADT

Week 2: Write C++ programs to implement the following using as singly linked list. a) Stack ADT b) Queue ADT

Week 3: Write C++ programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.

Week 4: Write a C++ program to perform the following operations: a) Insert an element into a binary search tree. b) Delete an element from a binary search tree. c) Search for a key element in a binary search tree.

Week 5: Write C++ programs that use recursive functions to traverse the given binary tree in a) Preorder b) Inorder and c) Postorder.

Week 6: Write C++ programs that use non-recursive functions to traverse the given binary tree in a) Preorder b) Inorder and c) Postorder.

Week 7: Write C++ programs for the implementation of BFS and DFS for a given graph.

Week 8: Write C++ programs for implementing the following sorting methods. a) Merge Sort b) Heap Sort

Week 9: Write a C++ program to perform the following operations a) Insertion into a B- tree b) Deletion from a B-tree

Week 10: Write a C++ program to perform the following operation a) Insertion into an AVL Tree b) Deletion from AVL Tree.

Week 11: Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

Week 12: Write a C++ program for implementing Knuth-Morris- Pratt pattern matching algorithm. (Note : Use Class Templates in the above Programs)

Text Books:

1. Data Structures A Pseudocode Approach with C++ , Indian edition, R.F.Gilberg and B.A.Forouzan, Cengage Learning.
2. Programming Prinicples and Practice using C++, B.Stroustrup, Addition-Wiesly (Pearson Education).
3. Data Structures and STL, W.J.Collins, Mc Graw Hill International edition.
4. Data Structures and algorithms with OODesign patterns in C++, B.R.Priess, John Wiley &sons.
5. The Art, Philosophy, and Science of OOP with C++, Rick Miller, SPD.
6. C++ for Programmers, P.J.Deitel and H.M.Deitel, PHI/Pearson.

II Year B. Tech. IT I-Sem

L	T	P	C
0	0	3	2

(EC0326) PART A: Digital Logic Design Lab:

1) Familiarization with Digital Integrated Circuits(74xx and 74xxx series TTL ICs) and To Verify the Behaviour of Logic Gates using Truth Table
2) Implementation of Boolean Function using Logic Gates in both SOP and POS forms
   a) F1(A,B,C)=AB+BC+A'Ç'
   b) F2(A,B,C)=(A+B)(B+C)(A'+C')
3) To Verify the functional table of IC74138 – 3X8 decoder
4) To Verify the functional table of IC74151 – 8x1 multiplexer
5) Implement and Verify the functional table of a Full Adder using
   a) Decoder – IC74138
   b) Multiplexer – IC74151
6) A) To Verify the functional table of IC7474 –D-FF
   B) To Verify the functional table of IC7476 – JK-FF
7) A) To Verify the functional table of IC7493 -4-bit counter
   B) To Verify the functional table of IC7495- shift register

PART B: Micro Processor Lab

Write Assembly Language Program (ALP) using TASM

1) Write an ALP to perform arithmetic operations using 16-bit
2) Write an ALP to evaluate the expressions considering 8-bit,16-bit b,c,d,e
   i) a=b+c-d*e ii) $z=(b^2+d^2)/c$
3) Write an ALP to find
   i) Sum of n-natural numbers
   ii) Factorial of numbers
   iii) Average of n-numbers
4) Write an ALP to
   a) Convert hexadecimal to decimal number
   b) Convert decimal to BCD number
5) Write an ALP to short array of numbers using 8086
6) Write an ALP to perform string operations
   i) Printing string ii) delete a sub string
7) Write an ALP to perform manipulation of strings
   i) Moving string into segments
   ii) Search a character in given string

II Year B. Tech. IT I-Sem

L	T	P	C
0	0	3	2

(IT0326) UNIX AND SHELL PROGRAMMING LAB

Syllabus:

Experiment I. a) Installation of Unix/Linux operating system.
b) Study of logging/logout details.
c) Study of Unix/Linux general purpose utility command list obtained from (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) commands.
d) Study of vi editor.(http://www.tutorialspoint.com/unix/pdf/unix-vi-editor.pdf)
e) Study of Bash shell, Bourne shell and C shell in Unix/Linux operating system.
f) Study of Unix/Linux file system (tree structure).
g) Study of .bashrc, /etc/bashrc and Environment variables.

Experiment 2 (C programs)

I. Write a C program to check whether the given string is palindrome or not using Command line substitution.
II. Write a C program to emulate the UNIX ls-l command.
III. Write a C program to check the given integer is prime or not.
IV. Write a C program to display Largest of three numbers.
V. Write a C program to check whether the given number is Avogadro number or not.
VI. Write a C program to find the Factorial of a given number.
VII. Write a C program that accept two integers as its arguments and computes the value of first number raised to the power of second number.

Experiment 3 (Shell scripts)

I. Write a shell script program to display list of user currently logged in.
II. Write a shell script program to display “HELLO WORLD”.
III. Write a shell script program to develop a scientific calculator.
IV. Write a shell Script program to check whether the given number is even or odd.
V. Shell script Program to search whether element is present is in the list or not.

Experiment 4 (Shell scripts and sed)

I. Shell script program to check whether given file is a directory or not.
II. Shell script program to count number of files in a Directory.
III. Shell script program to copy contents of one file to another.
IV. Create directory, write contents on that and Copy to a suitable location in your home
directory.
V. Use a pipeline and command substitution to set the length of a line in file to a variable.
VI. Write a program using sed command to print duplicated lines of Input.

Experiment 5 (grep, awk, perl scripts)

I. (a) Write a grep/egrep script to find the number of words character, words and lines in a file.
(b) Write an awk script to develop a Fibonacci series.
II. (a) Write a perl script to compute the power of a given number.

(b) Write an awk script to display the pattern of given string or number.

III. (a) Write a perl script to check a number is prime or not.

(b) Write an egrep script to display list of files in the directory.

Experiment 6 (programming)

I. Write a shell script program to display the process attributes.
II. Write a shell script to change the priority of processes.
III. Write a shell script to change the ownership of processes.
IV. Write a program to send back a process from foreground.
V. Write a program to retrieve a process from background.
VI. Write a program to create a Zombie process.
VII. Write a program to create a child process and allow the parent to display "parent" and
the child to display "child" on the screen.

Experiment 7 (Shell script programming)

I. Write a shell script program to check variable attributes of file and processes.
II. Write a shell script program to check and list attributes of processes.
III. Shell Script program to implement read, write, and execute permissions.
IV. Shell Script program for changing process priority.

Experiment 8 (gdb)

I. To execute programs using gdb to utilize its various features like breakpoints, conditional breakpoints.
II. Write a shell script program to include verbose Debug option for debugging.
III. Write a shell script program to include xtrace Debug option for debugging.
IV. Write a shell script program to include verbose and trace Debug option for debugging.

Experiment 9 (Installations)

I. Installation of VirtualBox (VMWare) on a PC having other operating system.
II. Installation of Cygwin on a PC having other operating system.
III. Installation of NS2 on a PC having Unix/Linux operating system.
IV. Installation of Unix/Linux packages.

Text Books:

1. Unix and Shell Programming, Behrouz A. Forouzan and Richard F. Gilberg, Thomson Brooks/Cole Publishing, 2003.
2. Your UNIX the ultimate guide, Sumitabha Das, 3rd Edition, TMH, 2006
3. Unix for Programmers and Users, Graham Glass, King Ables, 3rd Edition, Pearson Education, 2003.
4. The UNIX Programming Environment, Brian W. Kernighan, Rob Pike, Prentice-Hall, 1984.
5. UNIX: The Complete Reference, Kenneth Rosen, Douglas Host, Rachel Klee, Richard Rosinski, 2nd Edition, McGraw-Hill Professional, 2006.

II Year B. Tech. IT II-Sem

L	T	P	C
4	1	0	4

(IT0421) JAVA PROGRAMMING

Syllabus:

UNIT I:Java Programming: History of Java, Comments, Data Types, Variables, Constants, Scope and LifeTime of Variables, Operators, Hierarchy Expressions, Type Conversions and Casting, EnumeratedTypes, Control for Block Scope, Conditional Statements, Loops, Break and Continue Statements,Simple Java Standalone Programs, Arrays, Console Input and Output, Formatting Output,Constructors, Methods, Parameter Passing, Static Fields and Methods, Access Controls, ThisReference, Overloading Methods and Constructors, Recursions, Garbage Collections, Building Strings, Exploring Strings Class.

UNIT II:Inheritance: Inheritance Hierarchies Super And Sub Classes, Member Access Rules, Super Keyword,And Preventing Inheritance: Final Classes And Methods, The Object Class and Its Methods.**Polymorphism:** Dynamic Binding, Method Overloading, Abstract Classes and Methods.**Interface:** Interface vs. Abstract Classes, Defining an Interface, Implementing Interfaces, AccessingImplementations Through Interfaces References, Extending Interface.**Inner Classes:** Use 0f Inner Classes, Local Inner Classes, Anonymous Inner Classes, Static InnerClasses, Example.**Packages:** Defining, Creating and Accessing a Package, Understanding Classpath, ImportingPackages

UNIT III:Exception Handling: Dealing With Errors, Benefits of Exception Handling, The Classification ofExceptions, Exception Hierarchy, Checked Exceptions And Unchecked Exception, Usage of Try ,Catch, Throw, Throws, and Finally, Re-Throwing Exceptions, Exception Specification, Built inExceptions, Creating Own Exception Sub Classes.**Multithreading:** Difference Between Multiple Processes and Multiple Threads, Thread States,Creating Threads, Interrupting Threads, Thread Priorities, Synchronizing Threads, Inter-ThreadCommunication, Producer Consumer Pattern.

UNIT IV:Collection Framework in Java: Introduction to Java Collections, Overview of Java Collection Frame Work, Generics, Commonly used Collection Classes-Array List, Vector, Hash Table, Stack,Enumeration, Iterator, String Tokenizer, Random, Scanner, Calendar and Properties.**Files:** Streams-Byte Streams, Character Streams, Text Input/Output , Binary Input/Output, Random Access File Operations, File Management using File Class.**Connecting to Database:** JDBC Type I To IV Drivers, Connecting to a Database, Querying a Database and Processing The Results, Updating Data With JDBC..

UNIT V:GUI Programming with Java: The AWT Class Hierarchy, Introduction to Swing, Swing vs. AWT,Hierarchy for Swing Components, Containers-JFrame, JApplet, JDialog, JPanel, Overview of Some Swing Components, JButton, JLabel, JTextfield, JTextarea, Simple Swing Applications, Layout Management- Layout Manager Types- Border Grid and Flow.

Text Books:

1. Java the complete reference, 7th editon, Herbert Schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson Eduction.

References:

1. An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch,
2. John Wiley & sons.
3. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
4. An introduction to Java programming and object oriented application development,
5. R.A. Johnson- Thomson.

II Year B. Tech. IT II-Sem

L	T	P	C
4	1	0	4

(IT0422) DATA BASE MANAGEMENT SYSTEMS

Syllabus:

UNIT–I: INTRODUCTION: Introduction and applications of DBMS, Purpose of data base, Data, Independence, Database System architecture- Levels, Mappings, Database, users and DBA **DATABASE DESIGN:** Database Design Process, ER Diagrams – Entities, Attributes, Relationships, Constraints, keys, extended ER features, Generalization, Specialization, Aggregation, Conceptual design with the E-R model.

UNIT–II:THE RELATIONAL MODEL: Introduction to the relational model, Integrity constraints over relations, Enforcing integrity constraints, Querying relational data, Logical database design: E-R to relational, Introduction to views, Destroying/altering tables and views. **RELATIONAL ALGEBRA AND CALCULUS**: Preliminaries, relational algebra operators, relational calculus – Tuple and domain relational calculus, expressive power of algebra and calculus.

SQL: Basics of SQL, DDL,DML,DCL, structure – creation, alteration, defining constraints – Primary key, foreign key, unique, not null, check, IN operator, Functions – aggregate functions, Built-in functions – numeric, date, string functions, set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All , view and its types. Transaction control commands – Commit, Rollback, Save point, cursors, stored procedures, Triggers

UNIT–III: SCHEMA REFINEMENT AND NORMAL FORMS: Introduction to schema refinement, functional dependencies, reasoning about FDs. Normal forms: 1NF, 2NF, 3NF, BCNF, properties of decompositions, normalization, schema refinement in database design, other kinds of dependencies-overview of 4NF, 5NF, DKNF, case studies.

UNIT–IV: TRANSACTIONS MANAGEMENT: Transaction concept, transaction state, implementation of atomicity and durability, concurrent executions, Serializability, recoverability, implementation of isolation, transaction definition in SQL, testing for Serializability.

CONCURRENCY CONTROL AND RECOVERY SYSTEM: Concurrency control – locks based protocols, time-stamp based protocols, validation based protocols, multiple granularity, and deadlock handling. Recovery system – failure classification, storage structure, recovery and atomicity, log-based recovery, shadow paging, recovery with concurrent transactions, buffer anagement, failure with loss of non-volatile storage, advanced recovery techniques, remote backup systems.

UNIT–V: QUERY PROCESSING & QUERY OPTIMIZATION: Overview, measures of query cost, selection operation, sorting, join, evaluation of expressions, transformation of relational expressions, estimating statistics of expression results, evaluation plans, materialized views

OVERVIEW OF STORAGE AND INDEXING: Tree structured indexing – intuition for tree indexes, indexed sequential access method (ISAM), B+ Trees – a dynamic tree structure.

Text Books:

1. Data base System Concepts, Silberschatz, Korth, McGraw hill, V edition.
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition

References:

1. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate Pearson Education

II Year B. Tech. IT II-Sem

L	T	P	C
4	1	0	4

(IT0423) OPERATING SYSTEMS

Syllabus:

UNIT I: OPERATING SYSTEMS OVERVIEW: Introduction, operating system operations, process management, memory management, storage management, protection and security, distributed systems.
OPERATING SYSTEMS STRUCTURES: Operating system services and systems calls, system programs, operating System structure, operating systems generations.

UNIT II: PROCESS MANAGEMENT: Process concepts, process state, process control block, scheduling queues, process scheduling, multithreaded programming, threads in UNIX, comparison of UNIX and windows.
CONCURRENCY AND SYNCHRONIZATION: Process synchronization, critical section problem, Peterson‟s solution,synchronization hardware, semaphores, classic problems of synchronization, readers and writers problem, diningphilosophers problem, monitors, synchronization examples(Solaris), atomic transactions. Comparison of UNIX andwindows.

UNIT III: DEADLOCKS: System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery fromdeadlock banker‟s algorithm.
MEMORY MANAGEMENT: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement algorithms, allocation of frames, thrashing, case study - UNIX.

UNIT IV: FILE SYSTEM: Concept of a file, access methods, directory structure, file system mounting, file sharing, protection. File system implementation: file system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, comparison of UNIX and windows.

UNIT V: I/O SYSTEM: Mass storage structure - overview of mass storage structure, disk structure, disk attachment, disk scheduling algorithms, swap space management, stable storage implementation, tertiary storage structure.
I/O: Hardware, application I/O interface, kernel I/O subsystem, transforming I/O requests to hardware operations, streams, performance

Text Books:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2009), Operating System Concepts, 8th Edition, Wiley India Private Limited, New Delhi.
2. Sumitabha Das (2006), UNIX Concepts and Applications, 4th Edition, McGraw-Hill Education.

Reference Books:

1. Stallings(2006), Operating Systems, Internals and Design Principles, 5th Editi on, Pearson Education, India.
2. Andrew S. Tanenbaum (2007), Modern Operating Systems, 2nd Edition, Pren tice Hall of India, India.

II Year B. Tech. IT II-Sem

L	T	P	C
4	1	0	4

(HM0313) PROBABILITY AND STATISTICS

Pre Requisites: Mathematic – I

Objectives:
To make the student to understand the statistics and probability theories such as random variables, sampling distribution, tests of significance etc. so that he can apply them to engineering problems.

Syllabus:

UNIT-I: Probability
Sample space and events – Probability – The axioms of probability – Some Elementary theorems – Conditional probability – Baye,s theorem, Random variables – Discrete and continuous**.**

UNIT-II: Single Random variables and probability distributions
Random variables – Discrete and continuous. Probability distributions, mass function/ density function of a probability distribution. Mathematical Expectation, Moment about origin, Central moments Moment generating function of probability distribution.
Binomial, Poisson & normal distributions and their properties. Moment generating functions of the above three distributions. and hence finding the mean and variance.

UNIT-III: Multiple Random variables, Corrélation & Régression
Joint probability distributions- Joint probability mass / density function, Marginal probability mass / density functions, Covariance of two random variables, Correlation -Coefficient of correlation, The rank correlation.
Regression- Regression Coefficient, The lines of regression and multiple correlation & regression.

UNIT-IV: Sampling Distributions and Testing of Hypothesis
Sampling: Definitions of population, sampling, statistic, parameter. Types of sampling, Expected values of Sample mean and varience, sampling distribution, Standard error, Sampling distribution of means and sampling distribution of varience.
Parameter estimations – likelihood estimate, interval estimations .
Testing of hypothesis: Null hypothesis, Alternate hypothesis, type I, & type II errors – critical region, confidence interval, Level of significance. One sided test, Two sided test,

Large sample tests:
(i) Test of Equality of means of two samples equality of sample mean and population mean (cases of known varience & unknown varience, equal and unequal variances)
(ii) Tests of significance of difference between sample S.D and population S.D.
(iii) Tests of significance difference between sample proportion and population proportion difference between two sample proportions.

Small sample tests:
Student t-distribution,its properties; Test of significance difference between sample mean and population mean; difference between means of two small samples
Snedecor's F- distribution and it's properties. Test of equality of two population variences
Chi-square distribution , it's properties, Chi-square test of goodness of fit

UNIT- V: Queuing Theory & Stochastic Processes
Arrival Theorem – Pure Birth process and Death process M/M/1 Model. Introduction to Stochastic Processes – Markov process classification of states – Examples of Markov Chains, Stochastic Matrix, limiting probabilities.

Text Books:
1) Fundamentals of mathematical statistics by s c gupta and v.k.kapoor
2) Probability and statistics for engineers and scientists by sheldon m.ross,academic press
3) Probability and statistics for engineering and the sciencec by jay l.devore.

References:
1) Mathematics for engineers series –probability statistics and stochastic process by k.b.datta and m.a s.srinivas,cengage publications
2) Probability, statistics and stochastic process by prof.a r k prasad., wiely india
3) Probability and statistics by t.k.v.iyengar &b.krishna gandhi etel
4) A text book of probability and statistics, shahnaz bathul , cengage learning

II Year B. Tech. IT II-Sem

L	T	P	C
4	1	0	4

(IT0424) DESIGN AND ANALYSIS OF ALGORITHMS

Syllabus:

UNIT I: Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis. Divide and conquer: General method, applications Binary search, Quick sort, Merge sort, Stassen's matrix multiplication.

UNIT II: Disjoint Sets: Disjoint set perations, union and find algorithms, spanning trees. Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles. Connected components and biconnected components.

UNIT III: Dynamic Programming: General method, applications - Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT IV: Greedy method: General method, applications-Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem

UNIT V: Branch and Bound : General method, applications -Travelling sales person problem, 0/1 knapsack problem-LC Branch and Bound solution, FIFO Branch and Bound solution. NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP -Hard and NP-Complete classes, Cook's theorem.

Text Books:

1. Fundamentals of Computer Algorithms, Ellis Horowitz,Satraj Sahni and Rajasekharam,Galgotia publications pvt. Ltd.

2. Algorithm Design: Foundations, Analysis and Internet examples, M.T.Goodrich and R.Tomassia,John wiley and sons.

References:

1. Algorithm Design, Micheal P. Goordicoh, Roborto Tamassia, 2006.
2. The Design and Analysis of Computer Algorithms, Aho, HopCroft, Ullman, PHI/Pearson Education, 1974.

II Year B. Tech. IT II-Sem

L	T	P	C
0	0	3	2

(IT0425) JAVA PROGRAMMAING LAB

Syllabus:

Week 1:

a) Write a Java program that prints all real solutions to the quadratic equation ax2 + bx + c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions.

b) The Fibonacci sequence is defined by the following rule: The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it.

Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.

Week 2:

a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.(use Scanner class to read input)

b) Write a Java program to multiply two given matrices.

c) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use String Tokenizer class of java.util)

Week 3:

a) Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.

b) Write a Java program for sorting list of names. Read input from command line.

c) Write a Java program to make frequency count of words in a given text.

Week 4:

a) Write a Java program to create a Student class with following fields

i. Hall ticket number,ii. Student Name ,iii. Department Create „n‟ number of Student objects where „n‟ value is passed as input to constructor.

b) Write a Java program to demonstrate String comparison using == and equals method.

Week 5:

a) Write a java program to create an abstract class named Shape that contains an empty method named number Of Sides ( ).Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method number Of Sides ( ) that shows the number of sides in the given geometrical figures.

b) Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using JTable component.

Week 6:a) Write a Java program to read copy content of one file to other by handling all file related exceptions.

Week 7:
a) Write a Java program that reads a file name from the user, and then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
c) Write a Java program that displays the number of characters, lines and words in a text file.

Week 8:
a) Write a Java program that creates three threads. First thread displays “Good Morning” every one second, the second thread displays “Hello” every two seconds and the third thread displays “Welcome” every three seconds.
b) Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

Week 9:
Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.

Week 10:
a. Write a Java program for handling mouse events.
b. Write a Java program for handling key events using Adapter classes
b) Develop an applet that displays a simple message in center of the screen.

Text Books:
1. Java How to Program, H.M.Dietel and P.J.Dietel, 6th Edi-tion, Pearson Education/PHI.
2. Programming with Java, M.P.Bhave & S.A.Patekar, Pearson Education.

References:
1. Big Java, Cay Horstmann, Wiley Student Edition, 2nd Edi-tion, Wiley India Private Limited.
2. Introduction to Programming with Java, J Dean & R.Dean, McGraw-Hill Education.

II Year B. Tech. IT II-Sem

L	T	P	C
0	0	3	2

(IT0426) OPERATING SYSTEMS LAB

Syllabus:

1. Write Shell scripts for the following UNIX/LINUX commands:

a. ls b.cat c.cp d.wc

2. Write Shell scripts to illustrate the following constructs of

UNIX/LINUX operating system:

a. If b. if-else c. case d. while e. for f. until

3. Write programs using the I/O system calls of UNIX/LINUX operating

system:a. open, read, write, close, fcntl, seek, stat, opendir, readdir)

4. Write C programs to illustrate the following system calls of

UNIX/LINUX operating system: a.fork b. exec c.getpid, d.exit e. wait

5. Write C programs to simulate the following CPU Scheduling

algorithms:a. FCFC b.SJF c. RR, d. PRIORITY

6. Write a C program to simulate Bankers Algorithm for Deadlock

Avoidance and Prevention.

7. Write C programs to illustrate the following IPC mechnisms:

a.pipes, b.fifos c.message queues d.shared memory

8. Write a C program to implement the Producer – Consumer problem

using semaphores

using UNIX/LINUX system calls.

9. Write C programs to simulate the following file allocation strategies:

a. Sequential b. Indexed c. Linked

10. Write C programs to simulate the following file organization

Techniques:a. Single level, b.Two level c.Hierarchical d. DAG

11. Write C programs to simulate the following memory management techniques: a.Memory Variable Technique b. Memory Fixed Technique c.Paging, Segmentation

12. Write C programs to simulate the following Page Replacement

Techniques: a. FIFO b. LRU c. Optimal

Text Books:

1. Deitel & Deitel (2008), *Operating systems*, 3rd Edition, Pearson Education, India.
2. Dhamdhere (2008), *Operating Systems*, 2nd Edition, Tata Mc graw Hill, New Delhi.

References:

1.Sumitabha Das (2007), Your Unix The Ultimate Guide , Tata Mc Graw Hill , New Delhi , India.

2. Paul Love, Joe Merlino, Craig Zimmerman, Jeremy C. Reed, and Paul Weinstein (2005), *Beginning Unix*, Wiley Publishing, Inc.

II Year B. Tech. IT II-Sem

L	T	P	C
0	0	3	2

(IT0427) Data Base Management Systems Lab

Syllabus:

Week1: E-R Model

1. Analyze the problem carefully and come up with the entities in it.

2. Identify what data has to be persisted in the database.

3. This contains the entities, attributes etc.

4. Identify the primary keys for all the entities.

5. Identify the other keys like candidate keys, partial keys, if any.

Week2: Concept design with E-R Model

Week3: Relational Model

Week4: Normalization

Week5: Installation of Mysql and practicing DDL commands

Week6: Practicing DML commands

Week7: Querying In this week you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

Week8 and week9: Querying (continued…) You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

Week10: Triggers In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

Week11: Procedures In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

Week12: Cursors In this week you need to do the following: Declare a cursor that defines a result set. Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time.

Text Books:

1) ORACLE PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3 Edition

2) ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc-Graw Hill.

References:

1) SQL & PL/SQL for Oracle 10g, Black Book, Dr. P. S. Deshpande.
2) Fundamentals of Database Systems, Elmasri Navrate Pearson Education

II Year B. Tech. II-Sem.

L	T	P	C
2	0	0	0

(GN0492) HUMAN VALUES AND PROFESSIONAL ETHICS

Objectives:

- To introduce the basic concepts of universal human values
- To familiarize the students with desirable business and professional ethics, rights and responsibilities
- To prepare students against possible gaps and unethical practices in contemporary times
- To sensitise the students so that they can protect themselves and the organization from the possible professional crime malpractices

Outcomes:

- The students learn about diverse ethical issues rooted in society, trade, business, and environment on local as well as a global platform.
- The students appreciate their role as a responsible citizen, professional, and as managers, advisors, experts and consultants.
- The students will reflect and learn major values and ethics from their observations of a spiritual discourse and a visit to a business organization as a practical part of this course.

Syllabus:

UNIT I Human Values: Morals, values, ethics – integrity – work ethics –service learning –civic virtue – respect for others- living peacefully - Caring –sharing – honesty – courage –valuing time – cooperation – commitment –empathy – self-confidence –spirituality – character- Mini-Cases

UNIT II Professional Ethics: Profession- and professionalism - Two models of professionalism –Professional etiquette -Three types of Ethics or morality Responsibility in Engineering – Engineering standards –Engineering Ethics – Positive and Negative Faces. Professional Codes and Code of conduct of Institute of Engineers. Mini-cases.

UNIT III Professional Responsibilities: Ethical standards Vs Professional Conduct – Zero Tolerance for Culpable Mistakes – Hazards and Risks- Risk benefit analysis– congeniality, collegiality and loyalty. Respect for authority – conflicts of interest – Mini-Cases.

UNIT IV Professional Rights: professional rights and employee rights communicating risk and public policy – Whistle blowing - Professionals /engineers as managers, advisors, experts, witnesses and consultants – moral leadership-Regulatory compliances, Monitoring and control- Mini-Cases

UNIT V Ethics in global context: Global issues in MNCs- Problems of bribery, extortion, and grease payments – Problem of nepotism, excessive gifts – paternalism – different business practices – negotiating taxes. Mini-Cases.

Mini-projects

Project 1: The student of this course should invariably attend (or watch on internet/any TV channel/ Youtube/ social media) two speeches of 30 minutes duration each dealing with spiritual discourse and submit a report on the contents of the lecture proceedings.

Project 2: Visit any organization (including shops/ hotels or shopping malls in your region) of your choice and observe how the professionals perform the given job with a focus on professional ethics and human values.

References:

1. Aryasri, Human Values and Professional Ethics, Maruthi Publications.
2. S B George, Human Values and Professional Ethics, Vikas Publishing.
3. KR Govindan & Saenthil Kumar:Professional Ethics and Human Values, Anuradha Publications.
4. S K Chakraborthy & D.Chakraborthy: Human Values and Ethics, Himalaya.
5. M. Govindarajan, S. Natarajan, & V.S. Senthilkumar: Engineering Ethics(Includes Human Values), HI Learning Pvt. Ltd., New Delhi – 110001

***