Item No : 16.23

B.Tech. (CSE) Scheme
(For Candidates Admitted From 2008 Onwards)
NEW SYLLABUS

SEMESTER III:

Subject Code	Subject Title	Periods of Instruction			Credits
		L	T	P	
BCSCMA301 R01	Transforms & Complex Variables	3	1	0	4
BCSCCS302 R02	Computer Organization & Architecture	3	1	0	4
BCSCCS303 R02	Data Structures	3	1	0	4
BCSCCS304 R01	Digital Systems	3	1	0	4
BCSCCS305 R02	Microprocessors & Microcontroller	3	1	0	4
BCSDXX XXX	DE - 1	3	1	0	4
BCSCCS306 R01	Microprocessors & Microcontroller Lab	0	0	3	2
BCSCCS307 R02	Data Structures Lab	0	0	3	2
BCSCTP308	HR SKILLS I	1	0	0	1
	TOTAL	**19**	**6**	**6**	**29**

DEPARTMENTAL ELECTIVES:

BCSDCS302	Communication Engineering	3	1	0	4
BCSDCS303	Linux Programming	2	0	3	4

ADDITIONAL COURSES FOR LATERAL ENTRY STUDENTS

BCSDCS301 R01	Programming in C	3	1	0	4
BCSDCS304 R02	Programming in C Lab	0	0	3	2

BCSCMA301 R01 TRANSFORMS & COMPLEX VARIABLES
(Common for CSE, IT and ICT)

L	T	P	CREDITS
3	1	0	4

UNIT – I **(15 Periods)**

Laplace Transforms

Laplace Transform – definition – Transform of standard functions – properties – Transform of derivatives and integrals – Transform of the type $t^n f(t)$, $f(t)/t^n$ - inverse Laplace Transform – Convolution theorem – Transforms of periodic function, unit step function and unit impulse function – Application to ordinary differential equations with constant coefficients and integral equations – simultaneous linear differential equations with constant coefficients.

UNIT – II **(15 Periods)**

Fourier and Z transforms

Fourier Transform – The infinite Fourier Transform – sine and cosine transform – properties – inversion theorem – problems – convolution theorem – Parseval's identity – problems – finite Fourier transform – sine and cosine transform – Transform of derivatives – problems.

Z transforms – definitions – properties – convolution theorem – inverse Z transforms – solving difference equations using Z transform

UNIT – III **(15 Periods)**

Complex Differentiation

Complex variable – Analytic functions – Necessary and sufficient conditions for analyticity – Cauchy-Riemann equations in polar coordinates – Harmonic functions – Orthogonal system – Construction of an analytic function given real or imaginary parts – Conformal transformation – definition – e^z ,sinhz and Bilinear transformation only.

UNIT – IV **(15 Periods)**

Complex Integration

Complex integration – Cauchy's integral theorem, Integral formula – Taylor's and Laurent's series (without proof) – Singularities – zeros – poles and residues – Cauchy's residue theorem – evaluation of the definite integral using Contour Integrations $\left(\int_0^{2\pi} f(\sin\theta, \cos\theta)d\theta;\ \int_{-\infty}^{+\infty} \frac{f(x)}{g(x)}dx;\ \int_{-\infty}^{+\infty} f(x)(\sin mx / \cos mx)dx \text{ only} \right)$

Text Books:

1. Dr. P. Kandasamy et. al , "Engineering Mathematics", S.Chand & Co., 1997. [Units I & II]
2. Dr. M. K. Venkataraman, "Engineering Mathematics", National publishing Co., 1995 [Units III & IV]

References:

1. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley Eastern Ltd., Eighth Edition, 2003.
2. B.S.Grewal , "Higher Engineering Mathematics", Khanna Publishers, 2003.

BCSCCS302 R02 COMPUTER ORGANIZATION & ARCHITECTURE
(Common for CSE, IT and ICT)

L	T	P	CREDITS
3	1	0	4

UNIT - I **(12 Periods)**

Introduction: Organization and Architecture, Structure and Function **–** Computer Evolution**:** Brief history of computers – Designing for performance – Pentium and Power PC Evolution. Computer System: Components, Function – Interconnection Structures – Bus interconnection – PCI.

UNIT - II **(18 Periods)**

Memory: Cache memory: Memory system overview – Cache memory principles – Elements of Cache design – Semiconductor Main Memory – Advanced DRAM organization.

External Memory: Magnetic Disk– RAID – Optical Memory – Magnetic Tapes.

Input/Output: External Devices – I/O Modules – Programmed I/O – Interrupt Driven I/O – DMA – I/O Channels & Processors.

UNIT - III **(15 Periods)**

CPU: Computer Arithmetic: ALU – Integer Representation and Arithmetic – Floating Point Representation and Arithmetic.

Instruction Set: Characteristics – Operand Types – Operation Types – Addressing Modes – Instruction formats.

Processor organization – Register organization – Instruction Cycle – Instruction Pipelining – Pentium processor

UNIT - IV **(15 Periods)**

RISC: Instruction execution characteristics – Large Register File – Compiler based Register Optimization – Architecture – RISC Vs CISC Characteristics

Control unit: Micro–Operations – Control of Processors – Hardwired Implementation – **Micro Programmed Control**: Basic concepts – Microinstruction Sequencing – Microinstruction Execution – Applications of microprogramming.

Text Book:

1. William Stallings, “Computer Organization and Architecture – Designing for Performance”, Prentice Hall of India, Sixth Edition, 2003.

References:

1. Patterson, D. A., and Hennessy, J. L., “Computer Organization and Design: The Hardware/Software Interface”, Morgan Kaufmann Publishers, Fourth Edition, 2008.
2. John P.Hayes, “Computer Architecture and Organization”, Tata McGraw Hill, Third Edition, 2002.
3. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, “Computer Organization”, Tata McGraw Hill, Fifth Edition, 2002.

BCSCCS303 R02 DATA STRUCTURES
(Common for CSE, IT and ICT)

L	T	P	CREDITS
3	1	0	4

UNIT – I **(15 Periods)**

Pseudo code & Recursion: Introduction – Pseudo code – ADT – ADT model, implementations; Recursion – Designing recursive algorithms – Examples – GCD, Factorial, Fibonacci, Prefix to Postfix conversion, Tower of Hanoi; General linear lists – operations, implementation, algorithms

UNIT – II **(15 Periods)**

Linear Lists: Stacks – Basic Operations, Linked stack, Algorithms, Implementation, Applications; Queues – Operations, Linked list design, algorithms, applications, simulation; Complex implementations – circularly linked lists, doubly linked lists, multi-linked lists

UNIT – III **(15 Periods)**

Non-Linear Lists: Trees – basic concepts, binary trees, traversals, expression trees; General trees – insertion, deletion - Conversion of general to binary tree; Binary Search tree – basics, operations, ADT, applications – Threaded trees; AVL trees – basic concepts and implementation

UNIT – IV **(15 Periods)**

Heaps & Trie Structure: Heaps – basics, implementation, algorithms; Heap applications – Priority Queues; Multi-way Trees – B-tree implementation, algorithms, 2-3 tree, Trie structure; Searching – sequential and binary search, hashed searches, collision resolution; Graphs – basics, operations, storage structures, algorithms

Text Book:

1. Richard F. Gilberg & Behrouz A. Forouzan, “Data Structures: A Pseudocode Approach with C”, Thomson Learning, Second Edition, 2007.

References:

1. J.P.Trembley & P.G. Sorenson, "An Introduction to Data Structures with Applications", Tata McGraw Hill, Second Edition, 2002.
2. Seymour Lipschutz and G.A.Vijayalakshmi Pai, “Data Structures”, Tata McGraw Hill, 2005.

BCSCCS304 R01 DIGITAL SYSTEMS
(Common for CSE, IT and ICT)

L	T	P	CREDITS
3	1	0	4

UNIT-I (15 Periods)

Simplification of Boolean functions and Digital Logic Families : Review of number systems, Boolean expressions Simplification using K Map – Quine McClusky method – NAND and NOR implementation of Boolean functions logic families : Digital IC characteristics – Definitions – Noise immunity - TTL – Totem pole – Wired AND – ECL – I^2L – MOS logic – CMOS logic – Interfacing CMOS and TTL – Tristate logic – Comparison of IC families

UNIT - II (15 Periods)

Combinational Circuit Design : Half and Full adder – Half and Full Subtractor – BCD adder and subtractor – magnitude comparator (1 bit & 4 bit) - Encoder: Octal to Binary, Priority encoder – Decoder: 3 to 8 line decoder and BCD to 7 Segment decoder/ driver – Multiplexer (2:1 & 4:1) – Demultiplexer (1:2 & 1:4) – ALU – parity generator/ Checker– code converters: BCD to Binary , Binary to BCD, Gray to Binary, Binary to Gray.

UNIT - III (15 Periods)

Sequential Circuit Design: Flip Flops: Basic flip flop circuit – RS flip flop – D flip flop – JK flip flop – T flip flop – Master slave JK flip flop.
Registers: Shift registers: SISO, SIPO, PISO, PIPO and Bidirectional register.
Counters: Asynchronous up, down, up/down, Mod n and BCD counter –Synchronous up, down, up/down and BCD counters – Design of counters.
Introduction to Moore & Mealy machines.

UNIT - IV (15 Periods)

Semiconductor Memories and Algorithmic State Machines (ASM): Memory classifications – Characteristics – Sequential memory – Introduction to ROM, RAM, CAM and CCD memory.
ASM Charts-Timing considerations-Derivation of ASM charts-Realization of ASM charts-Control implementations-Design examples-Analysis and Design of asynchronous sequential networks-State assignment and races-Flow table reduction-Hazards.

Text Books:

1. R.P. Jain, “Modern Digital Electronics”, Tata McGraw Hill, Third Edition, 2006. [Units I, II, III & IV]
2. Donald D. Givone, “Digital Principles and Design”, Tata McGraw Hill, 2003. [Unit IV]

References:

1. Moris Mano, “Digital Logic and Design”, Pearson Education, 2006.
2. W.H Gothmann, “Digital Electronics – Introduction to theory and Practice”, Pearson Education, Second Edition, 2002.
3. T. L. Floyd, “Digital Fundamentals”, Pearson Education, 2006.
4. Charles H.Roth Jr., “Fundamentals of Logic Design”, Jaico Publishing House, Fourth Edition, 1999.

BCSCCS 305 R02 MICROPROCESSORS & MICROCONTROLLER
(Common for CSE, IT and ICT)

L	T	P	CREDITS
3	1	0	4

UNIT – I **(15 Periods)**

8086: Intel 8086 architecture – system connections, timing and interrupts – Minimum and maximum mode of operation – 8086 Hardware overview – Basic signal flow and 8086 buses –Bus activities during a write machine cycle – address decoder concepts – addressing and decoding – accessing memory and ports in microcomputer systems – 8086 timing parameters – 8086 interrupts and responses – 8086 interrupt types.

UNIT – II **(15 Periods)**

8087 Numeric Data Processor: NDP's data types – Processor architecture – Instruction set – Example.
8089 I/O processor: IOP architecture – Communication between CPU and IOP – Instruction set of 8089 – Example.

UNIT - III **(15 Periods)**

X86 processors: Intel 80286,386,486 architecture – instruction set, addressing scheme – modes of operations and memory management of 80286, 386 and 486 – comparative study of 286,386 and 486 – Overview of Pentium processor.

UNIT - IV **(15 Periods)**

8051 – The 8051 microcontroller introduction – Architecture – hardware details– Pins and ports – Memory – counters, timers, Serial data I/O and interrupts– Instruction set– Applications: Keyboards, Displays, Analog to Digital Interfacing and Digital to Analog Interfacing.

Text Books:

1. Barry B Brey, "The Intel Microprocessors: Architecture, Programming and Interfacing ", Prentice Hall of India, Fourth Edition, 1997. [Units I & III]
2. Yu Cheng Liu and Gibson, "Microcomputer Systems: 8086/8088 family architecture, Programming and Design", Prentice Hall of India, 2000. [Unit II]
3. Kenneth J Ayala, "The 8051 Microcontroller: Architecture, Programming and Applications", PRI, Second Edition, 1996. [Unit IV]

BCSDCS 302 COMMUNICATION ENGINEERING
(Common for CSE and IT)

L	T	P	CREDITS
3	1	0	4

UNIT – I (15 Periods)

Amplitude Modulation: Transmission And Reception: Electromagnetic spectrum – Need for modulation – Principles of amplitude modulation – AM envelope, frequency spectrum and bandwidth, modulation index, AM power distribution – SSB, DSBSC and VSB systems. AM modulator circuits – linear and non linear modulators – Envelope detector – AM transmitters – Low and high level transmitters, receiver parameters –AM receivers – choice of IF – TRF, super heterodyne receiver

UNIT – II (15 Periods)

Angle Modulation: Transmission And Reception : Angle modulation – FM and PM waveforms, phase deviation and modulation index, frequency deviation, Bandwidth requirements for Angle – modulated waves – direct and indirect method of FM generation – slope, balanced slope, ratio detector and Foster Seely FM discriminators. Direct and indirect FM transmitters, Comparison of AM, FM and PM

UNIT – III (15 Periods)

Digital Communication: Introduction, Sampling Theorem, pulse modulation, PCM – PCM sampling, sampling rate, signal to quantization noise rate, companding – percentage error, delta modulation, pulse transmission – PAM, PDM and PPM – modulation and demodulation techniques Introduction, Shannon limit for information capacity – OOK, ASK, FSK, PSK systems – Bit rate and baud rate consideration, comparison – QPSK, Quadrature Amplitude modulation – constellation diagram

UNIT – IV (15 Periods)

Communication Systems: Introduction to satellite communication – types of Satellites, orbits, earth station, components of communication satellite. Introduction to optical communication system – advantages – Principle of light transmission, types of fiber – transmitter and receiver block – fiber losses – Introduction to RADAR system – principle – range equation – PRF – pulsed Radar and CW Radar -Radar antennas

Text Books:

1. Kennedy and Davis, “Electronic Communication Systems”, Tata McGraw Hill, Fourth Edition 1999. [Units I & II]
2. Wayne Tomasi, “Electronic Communication Systems: Fundamentals Through Advanced”, Pearson Education, 2001. [Units III & IV]

References:

1. Simon Haykin, “Communication Systems”, John Wiley & Sons, Fourth Edition, 2001.
2. Behrouz Forouzan, “Introduction to data communications and Networking”, Tata McGraw Hill, 2004.
3. Roody D and Coolen J, “Electronic Communications”, Prentice Hall of India, Fourth Edition, 2007.

BCSDCS 303 LINUX PROGRAMMING
(Common for CSE and ICT)

L	T	P	CREDITS
2	0	3	4

UNIT – I (19 Periods)

Introduction and Shell Programming: Basic Linux Programming Concepts – Linux Design – Linux Documentation – Man Pages – Information Pages – Program Documentation – Internet Resources - Quick Introduction to Bash – Redirection and Piping – Variables – Functions – Conditionals and Loops – Shell utilities.

UNIT – II (19 Periods)

Regular Expressions, Emacs, Linux Data files and scripts: Introducing Regular Expressions – Understanding character classes – using quantifiers – Introducing Alternation and Grouping – Supporting Regular Expressions in Linux – Emacs modes and Emacs as an IDE – File system layout – Passwd and Shadow files – group files – init files and network files.

UNIT – III (19 Periods)

Processes and Signals : Understanding the process model – introducing process basics – starting and stopping processes – using return codes – synchronizing actions – understanding security – use of signals – signal handlers – signal sending -signals and system calls

UNIT – IV (18 Periods)

Shared Memory and Semaphores – Pipes, FIFOs – Internet Sockets: Synchronization with Semaphores – Communicating with Shared Memory, Setting up Pipes – Implementing Redirection – Addressing Communication issues – Using FIFOs – Introduction to TCP/IP – Protocols – Addressing Client Side Connections – Server side Connections.

Text Book:

1. John Goerzen, “Linux Programming Bible”, IDG Books India (P) Ltd., 2000.

References:

1. Richard Petersen, “Linux: The Complete Reference”, Tata McGraw Hill, Second Edition, 2001.
2. Neil Mathew and Richard Stones, “Professional Linux Programming”, Wrox Press Ltd., 2001.

BCSCCS 306 R01 MICROPROCESSORS & MICROCONTROLLER LAB
(Common for CSE, IT and ICT)

L	T	P	CREDITS
0	0	3	2

1. Study of 8086.
2. Basic arithmetic operations using 8086.
3. Linear search & binary search using 8086.
4. Insertion sort & Bubble sort using 8086.
5. Basic arithmetic operations using 8087.
6. Solving algebraic equations through Newton – Raphson method using 8087.
7. Interfacing ADC with 8086.
8. Basic operations using 8051.
9. Program for finding largest and smallest nu mber using 8051.
10. Program for Ascending and descending order using 8051.
11. Traffic light controller using 8051.
12. Code conversion using 8051.

13, 14 &15. Experiments on Advance Microprocessor (Using Pentium Processor)

BCSCCS307 R02 DATA STRUCTURES LAB

(Common for CSE, IT and ICT)

L	T	P	CREDITS
0	0	3	2

1. Create a Stack and do the following operations using arrays.
   (i) Push (ii) Pop (iii) Peep
2. Create a Queue and do the following operations using arrays
   (i) Enqueue (ii) Dequeue
3. Implement insertion, deletion and display operations on singly linked list
4. Implement conversion of infix expression to postfix using linked stack.
5. Implement insertion, deletion and display operations on doubly linked list
6. Implement insertion, deletion and display operations on circular doubly linked list.
7. Implement the following operations on a binary search tree:
   (i) Insert a node (ii) Delete a node (iii) Traversals - In-order, Pre order, & Post order
8. Implement the following operations on multi-way trees :
   (i) Insert a node (ii) Delete a node
9. Implement the following operations on B-trees :
   (i) Insert a node (ii) Delete a node
10. Implement the following operations on trie structure :
    (i) Insert a node (ii) Delete a node (iii) Search for a node
    (iv) Display using preorder traversal
11. Sort the list of numbers using Heap sort and Merge Sorting Techniques
12. Implement the following three searching techniques for a set of numbers
    (i) Linear Search (ii) Binary Search (iii) Hash Search
13. Traverse the nodes of the graph using BFS and DFS.

BCSCTP 308 HR SKILLS - I

L	T	P	CREDITS
1	0	0	1

S.NO	DETAILS	NO.OF CLASSES
1.	SWOT Analysis and presentation (Individual exercise)	2
2.	Listening Skill Exercise (Audio-visual Presentation)	1
3.	Team Skills-Product Launching	2
4.	Aptitude Test I	2
5.	Leadership Exercise (Problem solving exercise)	2
6.	Etiquettes-Discussion & Reporting	1
7.	Person I admire –Oral Presentation	2
8.	Emotional intelligence-Written Exercise	1
9.	End Semester Examinations	2
	TOTAL	**15**

BCSDCS 301 R01 PROGRAMMING IN C
(Common for CSE, IT and ICT)

L	T	P	CREDITS
3	1	0	4

UNIT – I **(15 Periods)**

Introduction: Structure of C – C fundamentals – Declarations – Data types – User defined data types – Operations – Type Conversion – I/O functions – Header file – Library functions.

Control Structure: Conditional constructs – control constructs – Multiple branching – Iteration and jump constructs.

UNIT – II **(15 Periods)**

Arrays: Declaration – Initialization and manipulation of single & multidimensional arrays- String Handling -String Manipulations and character handling functions – String manipulation operations.

Functions: Declarations – Definition – Scope – Arguments –Call by reference & value – Recursion – storage classes – preprocessor directives.

UNIT –III **(15 Periods)**

Structures & Unions: Structures and Unions- Declarations – initializations - Nesting of Structures – Structure with arrays and functions.

Pointers: Declarations – Accessing through pointers – pointer and character strings – pointer-to-pointer – Pointers in arrays, Structures and functions – Dynamic memory allocation.

UNIT – IV **(15 Periods)**

Files: Sequential Access – Random Access – opening & closing file – file processing using file manipulation functions.

Graphics: Graphics under Windows- Device independent drawing- Hello Windows- Drawing shapes – Types of pens-Types of brushes-Free hand drawing-Device Context-Displaying a Bitmap –Animation.

Text Books:

1. E. Balagurusamy, "Programming in ANSI C", Tata McGraw Hill, Third Edition, 2006.
   [Units I, II, III & IV]
2. Yeshavant.P Kanetkar ,"Let us C", BPB, Eighth Edition, 2008. [Unit : IV]

References:

1. Brian Kernighan & Dennis Ritchie, "C Programming Language", Prentice Hall of India, Second Edition, 1988.
2. Byron.S. Gottfried, "Theory and problems of Programming with C", TMH, 2000.

BCSDCS 304R02 Programming in C Lab

L	T	P	CREDITS
0	0	3	2

1. Programs on arithmetic operators (like simple interest, compound interest and Celsius to Fahrenheit)
2. Programs on conditional and looping statements (like solving Quadratic equation. Sine and Cosine series, Summation of digits)
3. Programs on Numerical Methods problems (like Runge Kutta Method, Gauss-Seidal method)
4. Programs on arrays (like Matrix operations, finding minimum or maximum in a set of numbers)
5. Programs on string manipulations (palindrome, pattern searching)
6. Programs on Functions and recursion (factorial, Fibonacci, tower of Hanoi)
7. Programs on structure and unions(student, employee details)
8. Programs on pointers (Sorting or Searching)
9. Programs on files(payroll processing)
10. Menu driven Programs to demonstrate graphic functions like (circle, line, ellipse, arc)
11. Programs on Dynamic memory allocation
12. Programs on Command Line Arguments