OFFICE OF THE REGISTRAR : DIBRUGARH UNIVERSITY : DIBRUGARH

Ref. No. DU/DR-A/6-1/15/749 Date. 05.08.2015

NOTIFICATION

As recommended by the Board of Studies in Computer Science, Dibrugarh University in its meeting held on **04.09.2014** the 113th Meeting of the Under Graduate Board, Dibrugarh University held on **24.02.2015** vide Resolution No **(20)** has approved the draft of the modified Syllabus of Computer Science in the B.Sc. (General) Programme giving effect from the academic session 2015- 2016.

Issued with due approval.

(Dr. B.C. Borah)
Deputy Registrar (Academic)
Dibrugarh University.

Copy to:

1. The Vice-Chancellor, Dibrugarh University for favour of information.
2. The Dean, School of Science and Engineering, Dibrugarh University.
3. The Registrar, Dibrugarh University for favour of information.
4. The Controller of Examinations, Dibrugarh University for favour of information and needful.
5. The Centre i/c, Centre for Computer Studies, Dibrugarh University for favour of information.
6. The Dy. Controller of Examinations (A) and (C) Dibrugarh University for favour of information and needful.
7. The Principals of the Colleges conducting the Computer Science (General) subject in the B.Sc. Programmes in the Semester System, for favour of information and needful.
8. Sri G. Chetia, Asstt. Professor, Centre for Computer Studies, Dibrugarh University, with a request to put up the notice on the website.
9. File.

(Dr. B.C. Borah)
Deputy Registrar (Academic)
Dibrugarh University

B.Sc. (GENERAL) PROGRAMME
Computer Science (CSCG)
SCHEME OF COURSES

(This new course structure is proposed by the BOS in Computer Science, Dibrugarh University)

COURSE	LECTURE DURATION(LD)	MARKS
SEMESTER-I		
1. Course Code: CSCG-101 **Subject: Computer Organization & Architecture**	**35 hours**	**48**
Internal Assessment		**12**
2. Course Code: CSCG-102(Practical) **Subject: 8085 Assembly language Programming**	**30 hours**	**32**
Internal Assessment		**08**
SEMESTER-II		
3. Course Code: CSCG-201 **Subject: Programming and Problem Solving with C**	**35 hours**	**48**
Internal Assessment		**12**
4. Course Code: CSCG-202(Practical) **Subject: Programming using C**	**30 hours**	**32**
Internal Assessment		**08**
SEMESTER-III		
5. Course Code: CSCG-301 **Subject: Data Structure with C++**	**35 hours**	**48**
Internal Assessment		**12**
6. Course Code: CSCG-302 (Practical) **Subject: Data Structure Programming using C++**	**30 hours**	**32**
Internal Assessment		**08**
SEMESTER-IV		
7. Course Code: CSCG-401 **Subject: Operating System**	**35 hours**	**48**
Internal Assessment		**12**
8. Course Code: CSCG-402 (Practical) **Subject: Unix / LINUX Commands & Shell Programming**	**30 hours**	**32**
Internal Assessment		**08**
SEMESTER-V		
9. Course Code: CSCG-501 **Subject: Data Communication & Computer Networks**	**35 hours**	**48**
Internal Assessment		**12**

10. Course Code: CSCG-502(Practical) **Subject: Network Programming** **Internal Assessment**	**30 hours**	**32** **08**
SEMESTER-VI		
11. Course Code: CSCG-601 **Subject: Data Base Management System(DBMS)** **Internal Assessment**	**35 hours**	**48** **12**
12. Course Code: CSCG-602(Practical) **Subject: DBMS practical using MS ACCESS ,My SQL, VB** **Internal Assessment**	**30 hours**	**32** **08**

CSCG-101: COMPUTER ORGANIZATION & ARCHITECTURE

Max Marks: 60
(In-Semester – 12, End-Semester - 48)
LD: 35 Hours

Unit I **Marks:6**

Digital Logic circuits: Introduction to Number systems & Logic gates, Definition of Combinational circuits & Sequential circuits with examples.

Unit II: **Marks:6**

Basic Computer Organization and Design: Instruction Codes, Computer registers, bus system, instructions, instruction cycle, timing and control, input output and interrupt

Unit III **Marks: 6**

Central Processing Unit: General Register Organization, Stack Organization, Instruction format, Addressing Modes

Unit IV **Marks:10**

Input Output organization: Peripheral devices, I/o interface, Data transfer, Program controlled, Interrupt controlled and DMA

Unit V **Marks: 10**

Memory Organization: Memory Hierarchy, Main memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual memory

Unit VI **Marks: 10**

8085 Microprocessor, Block Diagram, Pin Diagram

Books:

1.Carl Hamachar , Zvonko Vranesic , Safwat Zaky, 'Computer Organization, Mc Graw Hill', 5th Edition, 2002.

2. **B. Govindarajalu**, 'Introduction to Computer Architecture and Organization: Design Principles and Applications', McGraw Hill Education (India) Private Limited, 2nd edition, 2010.

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CSCG-102 : 8085 ASSEMBLY LANGUAGE PROGRAMMING (PRACTICAL)

Max Marks: 40
(In-Semester - 08 End-Semester - 32)
LD: 30 Hours

8085 Assembly Language programming Lab (Using simulator and kits);

a) Arithmetic and logical instruction
b) Memory related operation
c) Looping technique
d) Counting and indexing
e) Stack and Subroutine
f) Interrupt

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CSCG-201: PROGRAMMING AND PROBLEM SOLVING WITH C

Max Marks: 60
(In-Semester - 12 End-Semester - 48)
LD: 35 Hours

Unit I: **Marks: 6**

Introduction to C: character set, constants, variables, keywords, instructions
Data types in C

Unit II **Marks: 7**

Decision control structures, loop control structures, case control structures
Arithmetic and logical operators, bit wise operators, Type casting
Storage classes in C

Unit III: **Marks: 15**

Functions, C pre-processors, Arrays, String handling

Unit IV: **Marks: 20**

Structures, array of structures, union
Pointers, Dynamic Data Structures in C
File Handling

Books:

1. Brian W. Kernighan, Dennis M. Ritchie, 'The C Programming Language,' PHI, 2nd edition, 1990.
2. T Jeyapoovan, 'Programming with C,' Vikas Publication, Reprint, 2006.

CSCG-202: PROGRAMMING USING C (PRACTICAL)

Max Marks:40
(In-Semester - 08 End-Semester - 32)
LD: 30 Hours

Write programs to implement the topics covered in Unit I, Unit II, Unit III, and Unit IV of CSCG-201

Books:

1. Gottfried , Programming in C ,, Schaum series
2. T Jeyapoovan, 'Programming with C,' Vikas Publication, Reprint, 2006.
3. A. Kamthane, "Programming with ANSI & Turbo C", First Edition, 2002, Pearson education.

CSCG-301: DATA STRUCTURE WITH C++

Max Marks: 60
(In-Semester - 12 End-Semester - 48)
LD: 35 Hours

Unit I **Marks:5**

Introduction to Object Oriented Programming, Object oriented Paradigm, Introduction to C++, Differentiate C & C++, Data types, Operators, Decision making and Loop control statements of C++.

Unit II **Marks:5**

Introduction to Data-structures: Definition of data structures and abstract data-types.

Unit-III **Marks:10**

Stack: Definition, Array implementation of stack (static stack): Operations PUSH, POP, TRAVERSE. **Queue:** Definition, array implementation of queue (static queue) : Operations INSERT, DELETE, TRAVERSE. **Comparisons** of array stack and queue data structures. **Introduction** to Circular queue, priority queue, Double ended queue, multiple queue.

Unit-IV **Marks:10**

Pointers : Introduction, Pointers to structures, malloc, calloc functions.
Linked list : Singly and Doubly Linear link lists, Singly and doubly circular linked list **:** Definitions, operations INSERT , DELETE, TRAVERSE on all these list. (Insertion operation includes – insertion before a given element, insertion after a given element, insertion at given position, insertion in sorted linked list) , Implementations of Stack and Queue using linked list (Dynamic stack).

Unit-V **Marks:8**

Trees

Definitions and concepts – Binary trees, Sequential and Linked Representation of Binary
Tree Trees, Insertation and deletion on binary trees, Binary Tyree Traversal

Unit-VI **Marks:10**

Applications of linked list :

String representation & string operations like string length, string reverse, string comparison, string concatenation, string copying, convert upper-case to lower and vice-versa, substring using linked list.
Simple Searching Algorithms: Linear or sequential search, Binary search.
Simple Sorting Algorithms: Bubble sort, Selection sort, Insertion Sort on array.

Books:

1. Seymour Lipschutz,' Data Structures,'Tata McGraw Hill, Reprint 2010.
2. G.S. BALUJA, 'Data Structure Through C++,' Dhanpat Rai Publication, Reprint 2010

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CSCG-302 : DATA STRUCTURE PROGRAMMING USING C++ (PRACTICAL)

Max Marks:40
(In-Semester - 08 End-Semester - 32)
LD: 30 Hours

1. Write programs in C++ to implement simple Stack, Queue, Circular Queue, Priority Queue.
2. Write menu driven programs that implements singly linked list for the following operations: Create, Display, Concate, merge, union, intersection
3. Write menu driven programs that implements doubly linked list for the following operations: Create, Display, Count, Insert, Delete, Search, Copy, Reverse, Sort
4. Write menu driven programs that implements doubly linked list for the following operations: Create, Display, Concate, merge, union, intersection
5. Write menu driven programs that implements singly circular linked list for the following operations: Create, Display, Count, Insert, Delete, Search, Copy, Reverse, Sort
6. Write programs in C++ for sorting methods.
7. Write menu driven programs in C++ to
    a. Create a binary search tree
    b. Traverse the tree in Inorder, Preorder and Postorder
    c. Search the tree for a given node and delete the node
8. Write a program in C++ to implement insertion and deletion in AVL tree
9. Write a menu driven program that implements Heap tree (Maximum and Minimum Heap tree) for the following operations. (Using array) Insert, Delete
10. Write a program in C to implement insertion and deletion in B tree

Books:

1. Lipschutz , 'Data Structures (Schaume's Outlines)' ,TMH Publications.
2. Adam Drozdek Thomson ,'Data Structures and Algorithm in C++', Vikas Publication

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CSCG-401: OPERATING SYSTEM

Max Marks: 60
(In-Semester - 12 End-Semester - 48)
LD: 35 Hours

Unit -I:

Introduction to Operating Systems **Marks:12**

What is an operating system (OS)?, History of OS, Simple Batch Systems, Multi programmed Batched Systems, Time-Sharing Systems, Personal Computer Systems, Distributed Systems and Real –Time Systems, Operating System Structures-Command Interpreter System, Operating System Services, System Calls, System Programs.

Unit -II:

Process Management **Marks:12**

Process Concept, Process control Block, Process Scheduling, CPU Scheduling – Basic Concepts, Scheduling Algorithms – FIFO, RR, SJF, Multi-level, Multi-level feedback.

Unit-III

Storage Management **Marks:12**

Basic Concepts, Logical and Physical Address Space , Swapping, Contiguous Allocation, Paging, Segmentation, Virtual Memory – Demand Paging, Page Replacement, Page Replacement Algorithms.

Unit-IV:

File System **Marks:12**

File Concept, Access Methods, Directory Structure, Protection, File system Structure, Allocation Methods, Free-Space Management.

Books:

1. Stallings, ‘W. Operating systems’ PHI.
2. Silberschultz, Abraham and Galvin,Peter Raer. ‘Operating system Concepts’,5th Edition , John Wiley And Sons Publication .

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CSCG-402: UNIX/LINUX COMMANDS & SHELL PROGRAMMING (PRACTICAL)

Max Marks:40
(In-Semester - 08 End-Semester - 32)
LD: 30 Hours

Unit-I:
Linux introduction - Basic Features, Different flavors of Linux. Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell. Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories.

Unit-II:
Installation of Linux system- Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down process, init and run levels.
Essential Linux commands Understanding shells, Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces.

Unit-III:
Processes in Linux-process fundamentals, connecting processes with pipes, tee, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron, batch commands, kill, ps, who, sleep, Printing commands, find, sort, touch, file, file related commands-ws, sat, cut, dd, etc. Mathematical commands- bc, expr, factor, units.
Creating and editing files with vi, joe & vim editor

Unit-IV:
Shell programming- Basic of shell programming, Various types of shell available in Linux, comparisons between various shells, shell programming in bash, read command, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automate system tasks. Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Flter using regular expressions – grep, egrep, and sed.
awk programming – report printing with awk.

Books:

1. Sumitabha Das **,** **'**UNIX – Concepts & Applications (Third Ed.)**'**, Tata McGraw Hill Publications.
2. Graham Glass & King Ables **,**'Unix for programmers and users (Third Ed.)**',** Pearson Education India. (Low Prices Edition).

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CSCG-501: DATA COMMUNICATION & COMPUTER NETWORKS

Max Marks: 60
(In-Semester - 12 End-Semester - 48)
LD: 35 Hours

Unit – I: **Marks:10**

Data Communication Component, Distributed processing, network criteria, protocol and standards, Line configuration, Topologies, Transmission mode, Categories of networks, Inter-networks. Devices: Repeaters, bridges, gateways, routers

Unit – II: **Marks:10**

The OSI model, Function of the layers, TCP/IP Protocol suite, Analog - Digital data & signals, Periodic and Aperiodic signals, Time and Frequency Domains, Composite Signals.

Unit – III: **Marks:10**

Digital to Digital Conversion, Analog to digital conversion, Digital to analog Conversion, Analog to Analog conversion, Digital data transmission, DTE- DCE Interface, EIA449, EIA530, X.21 Standards, Modems, Cable Modem.

Unit – IV: **Marks:8**

Transmission media - Introduction, Guided Media, Unguided Media, Transmission Impairment, Performance, Wavelength, Shannon capacity, Media Comparison, Multiplexing– FDM, WDM, TDM, Multiplexing Application, DSL and types of Digital subscriber lines.

Unit – V: **Marks:10**

Error detection and correction, types of errors, detection**,** VRC, LRC, CRC, error correction, LAN Project 802, IEEE 802.x, LLC,MAC,PDU, Ethernet , Token Bus, Token Ring. FDDI,LAN Comparison.

BOOKS

1. Behrouz A Forouzan, 'Data Communications and Networking,' 5th Edition , TATA Mcgraw Hills, 2013
2. William Stalling, 'Data and Computer Communications,' 8th Edition Pearson Education, 2007

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CSCG-502:NETWORK PROGRAMMING
(PRACTICAL)

Max Marks:40
(In-Semester - 08 End-Semester - 32)
LD: 30 Hours

Network commands using Unix/Linux
Socket Programming Basics
LAN Setup basics

Books:

W. Richard Stevens, Bill Fenner and AndrewM. Rudoff , "UNIX Network Programming," Volume 1, third edition, Prentice Hall

CSCG-601:DATA BASE MANAGEMENT SYSTEM (DBMS)

Max Marks: 60
(In-Semester - 12 End-Semester - 48)
LD: 35 Hours

Unit I:
Databases and database users **Marks:5**
Database System Concepts and Architecture: Data models, schemas and instances, DBMS architecture, database languages and interfaces, classification of DBMS

Unit II:
Record Storage And Primary File Organization: **Marks:8**
Introduction, secondary storage devices, buffering of blocks, operations on files, files of unordered record (heap files), files of ordered records (sorted files), hashing techniques Index structures for files: single level ordered indexes, multilevel indexes, dynamic multilevel indexes using B- trees and B+- trees

Unit III:
Conventional Data Models: **Marks:10**
Network data model, hierarchical data model , relational model, E-R Model

Unit IV:
Relational Data Models: **Marks:10**
Relational model concepts, relational model constraints, update operations on relations, defining relations ,Relational algebra
Relational database languages: SQL

Unit V:
Database Design: **Marks:10**
Functional dependencies and normalization for relational database

Unit VI:
Transaction Processing Concept: **Marks:5**
Introduction, transaction and system concept, properties, schedules and recoverability, serializability of schedules, Concurrency control, error recovery and security.

Books:

1. Silberschatz A, Korth H.F, Sudarshan S, 'Database System Concepts, 3/e', McGraw-Hill (IE), 2007.
2. Elmasri R, Navathe S.B., 'Fundamentals of Database Systems', Benjamin Cummings Publishing Company, 2008

CSCG-602 :DBMS PRACTICAL USING MS ACCESS, MY SQL, VB (PRACTICAL)

Max Marks:40
(In-Semester - 08 End-Semester - 32)
LD: 30 Hours

Unit-I:
SQL commands: table creation, deletion, updation, data insertion, modification, record indexing, queries etc.

Unit-II:
Form creation, data insertion, updation , modification etc through form

Unit-III:
Report creation, data insertion, printing etc

Books:

1. Oracle SQL Book:
   A) Ivan Bayross , "SQL, PL/SQL-The Programming Language of Oracle" (4th Revised Edition) BPB publication.
   B) Kevin Loney ,"Oracle 9i- The complete reference" (1st Edition) Mc. Graw Hill.

2. My-SQL:
   A) Vikram Vaswani ,"My SQL- The complete reference" (1st Edition) Mc. Graw Hill.
   B) Marc Delisle ,"Creating you're my SQL Database Practical Design Tips and Techniques",3e,Shroff Publishers.

3. Visual Basic 6 & VB.net:
   A) Evangelos Petroutsos ,"Mastering™ Visual Basic 6"Sybex Publishers.
   B) John Smiley ,"Learn to program with VB.net" 2008 Edition,Smiley Publishing.