



Vishwavidyanilaya Karyasoudha  
Crawford Hall, Mysuru- 570 005  
Dated: 09.10.2018

No.AC.2(S)/31/18-19

**REVISED NOTIFICATION**

Sub: Revision of syllabus & Scheme of Examination for BCA and B.Sc.  
Computer Science from the academic year 2018-19.

- Ref: 1. Decision of the Board of Studies in Computer Science (UG) held on  
10.09.2018.  
2. Decision of the Faculty of Science & Technology Meeting held  
on 21.04.2018.  
3. Decision of the Deans committee meeting held on 22.05.2018.  
4. University notification no. AC2(S)/31/18-19 Dated: 15.06.2018.  
5. Decision of the Academic council meeting held on 15.09.2018.

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The Board of Studies in Computer Science which met on 10.09.2018 has recommended to revise the syllabus and scheme of examination as per CBCS pattern for B.C.A. and B.Sc. Computer Science from the academic year 2018-19.

The Academic Council at its meeting held on 15<sup>th</sup> September 2018 has also approved the above said proposal and the same is hereby notified.

The University notification cited under reference (4) has been withdrawn.

The revised syllabus is annexed herewith and the contents may be downloaded from the University website i.e. [www.uni-mysore.ac.in](http://www.uni-mysore.ac.in).

Draft approved by the Registrar

To:

1. The Registrar (Evaluation), University of Mysore, Mysore.
2. The Dean, Faculty of Science & Technology, DOS in Zoology, Manasagangotri, Mysore.
3. The Chairperson, BOS in Computer Science, DOS in Computer Science, Manasagangotri, Mysore.
4. The Chairperson, Department of Studies in Computer Science, Manasagangotri, Mysore.
5. The Director, College Development Council, Moulya Bhavan, Manasagangotri, Mysore.
6. The Deputy/Assistant Registrar/Superintendent, AB and EB, UOM, Mysore.
7. The P.A. to the Vice-Chancellor/Registrar/Registrar (Evaluation), UOM, Mysore.
8. Office file.

**BCA Programme (CBCS): 2018-19 onwards**

Semester	Core DSC	Credits	Elective DSE	Credits	SEC	Credits
I	DSC-1	6				
	DSC-2	6				
	DSC-3	6				
II	DSC-4	6				
	DSC-5	6				
	DSC-6	6				
III	DSC-7	6				
	DSC-8	6				
	DSC-9	6				
IV	DSC-10	6				
	DSC-11	6				
	DSC-12	6				
V			DSE-1	6	SEC-1	2
			DSE-2	6	SEC-2	2
			DSE-3	6		
VI			DSE-4	6	SEC-3	2
			DSE-5	6	SEC-4	2
			DSE-6	6		

**Discipline Specific Courses:**

DSC-1: Computer Concepts and C Programming	4:0:2
DSC-2: Digital Electronics and Computer Organization	4:0:2
DSC-3: Discrete Transformations	4:2:0
DSC-4: Data structures and File Processing	4:0:2
DSC-5: System softwares and Operating Systems	4:0:2
DSC-6: Fundamentals of Information Technology	4:2:0
DSC-7: Object Oriented Programming with Java	4:0:2
DSC-8: Operation research	4:2:0
DSC-9: Accounting	4:0:2
DSC-10: Database Management Systems	4:0:2
DSC-11: Numerical and Statistical Analysis	4:0:2
DSC-12: Data Communication and Computer Networks	4:2:0

**List of Electives for both Vth and VIth semesters:**

(Select three of the following electives in Vth semester and two of the following electives in VIth semester, without repetition.)

Computer Graphics and animation	(L:T:P::4:0:2)
Software Engineering	(L:T:P::4:2:0)
.NET Programming	(L:T:P::4:2:0)
Software Testing	(L:T:P::4:1:1)
Web Technology	(L:T:P::4:0:2)
Digital Image Processing	(L:T:P::4:0:2)
Network Security	(L:T:P::4:2:0)
Cloud Computing and Big Data Analytics	(L:T:P::4:1:1)

**Skill Oriented Course**

SEC-1 :: DTP (Page Maker and CorelDraw)	(L;T:P::1:0:1)
SEC-2 ::Cyber Security	(L;T:P::1:0:1)
SEC-3 :: Introduction to Latex	(L;T:P::1:0:1)
SEC-4 ::Android Programming	(L;T:P::1:0:1)

## BCA

### DSC-4 : Data Structures and Its Applications (LTP::4:0:2)

6 Credits

#### Unit-1

Basic data structure : Primitive and non primitive, Abstract data structure, Operations, Data representation, Arrays - Memory representation of one and two dimensional arrays, Stack – Operations, Applications – Recursion, infix to postfix conversion, evaluation of postfix expression, Queues – Operations, Applications, circular queue-Operations, Dequeue, priority queue – uses of priority queues, Linked list - Dynamic memory allocation, Singly linked list – Operations, Circular linked list – Operations, Applications of linked list, doubly linked list – memory representation

#### Unit-2

Tree – Terminologies, tree properties, binary tree-properties, memory representation – Array and Linked list representation, Binary search tree – Creation through insertion, searching, deletion algorithms, Tree traversal, balanced trees.

#### Unit-3

Searching and sorting – sequential and binary search, internal and external sorting - bubble, selection, insertion, quick sort and merge sort, comparison of different sorting techniques, Memory management : Garbage collection algorithm for equal sized blocks, storage allocation of objects with mixed size, buddy system,

#### Unit-4

Physical devices : Characteristics of storage devices such as disks, tapes, I/O buffering, basic file system operations – create, open, close, extend, delete, read block and write block, protection mechanism, file organization : sequential, indexed, direct, directory structure: single level, two level, tree, acyclic directory structure.

#### Books Recommended

1. M.T. Goodrich, R. Tamassia and D. Mount, *Data Structures and Algorithms in C++*, John Wiley and Sons, Inc., 2004.
2. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, *Introduction to Algorithms*, 2nd Ed. Prentice-Hall of India, 2006.
1. 3. E.Horowitz and S.Sahani, *Fundamentals of Data structures*, Galgotia Book source Pvt. Ltd., 2003.

## BCA

### DSC-5 SYSTEM SOFTWARES AND OPERATING SYSTEMS (L:T:P::4:0:2) 6 Credits

#### Unit 1: Machine Architecture, Assembler and Loaders

Introduction, System software and machine architecture, Simplified Instructional Computers (SIC) and its architecture, Instruction Formats of IBM-360, Assembler ,Introduction, General design procedure, design of Assembler, statement of problem, data Structure, Format of Databases, Algorithm for pass 1 and pass 2. Loader schemes-compile and go loader scheme, general loader, Absolute loader(Algorithm and Flow chart), Relocating loader, Direct linking loader, overlays, Dynamic loading.

#### Unit 2: Introduction and process management

Definition of Operating System, Need, Early systems, Simple monitors, Batch Systems, Multiprogramming, Time Sharing, Real time, Parallel and Distributed systems. Computing Environments – Traditional, Client Server, Peer-to-Peer and Web based. Process Management: Process concept – meaning of process, sequential and concurrent processes, process state, process control block, threads, Process scheduling – scheduling queues, schedulers, context switch.

#### Unit 3: Scheduling and Deadlocks

Processor -CPU I/O burst cycle, CPU Scheduler, Preemptive scheduling, dispatcher.

Scheduling criteria, Scheduling algorithms: First-Come-First-Served (FCFS), Shortest Job First (SJF), Priority Scheduling, Round Robin. Real time scheduling with pre-emption and Non-preemption. Deadlocks: Definition with example, System model, Dead lock characterization – Necessary Conditions Resource Allocation Graph, Dead lock prevention, Avoidance and detection, Recovery from dead lock.

#### Unit 4: Memory Management

Introduction to memory management, functions of memory management, partitioned memory- single partition, multiple partition (MFT & MVT), fragmentation, memory management technique- paging, segmentation, Demand paging, page replacement, page replacement algorithms- FIFO, LRU, Optional page replacement.

#### Text Books:

1. System programming – John. J. Donovan.
2. System Software – Leland L. Beck, Third edition, Addison Wesley 1997.
3. Operating System Concepts, Abraham Silberschatz and Peter Baer Galvin, Fifth edition, Addison - wesley 1989.
4. Operating System Concepts & Design, Milan Milonkovic, II Edition, McGRaw Hill 1992.
5. Operating Systems, Stallings, Pearson Edition.
6. Operating System Concepts, Tanenbaum, Pearson Education.

## **BCA**

**DSC-6 : Fundamentals of Information Technology (LTP::4:2:0)**

**6 Credits**

### **Unit - I**

Introduction- Characteristics of Computers, Evolution of computers, Capabilities and limitations of computers, Generations of computers, Types of computers (micro, mini, main frame, super computers, Laptop, Tablets), Analog, Digital and hybrid computers, Block diagram of computer, computer applications business and scientific. Data organization: Drives, Files, Directories. Basic components of computers: Input devices- Keyboard, mouse, Touch Screens, Joystick, Electronic pen, Trackball, Scanning Devices-Optical Scanners, OCR, OMR, Bar Code Readers, MICR, Digitizer, Electronic card reader, Image Capturing Devices-Digital Cameras.

### **Unit - II**

Output devices- Monitors- CRT, LCD/TFT, Printers- Dot matrix, Inkjet, Laser, Plotters- Drum, Flatbed, Screen image projector. Types of Memory (Primary And Secondary) RAM, ROM, PROM, EPROM, EEPROM Secondary Storage Devices- Magnetic Tape, Magnetic Disks-Internal Hard Disk, External Hard Drives, Floppy Disks, Optical Disks-CD, CD-R, CD-RW, DVD, Solid State Storage-Flash Memory, USB Drives.

### **Unit- III**

Computer Software- Software and its Need, Types of software-System software, Application software, System software-operating system, utility program, programming languages, assemblers, compilers and interpreter, introduction to operation system for PCs-DOS, windows, Linux, Types of Programming Languages: Machine Languages, Assembly Languages, High Level Languages, Virus working, feature, types of viruses, virus detection prevention and cure.

### **Unit - IV**

Introduction to computer network, types of computer network: LAN, WAN, MAN, Topologies Computer Security :The Need for Computer Security, Basic Security Concepts, Threats to Users, Threats to Hardware, Threats to Data, Taking protective measures– Protecting Yourself, Protecting your privacy, Keeping your Data Secure. Introduction to GUI, Internet & www, email, browsers, search engines, internet chat, creating static web pages, E commerce basics, EDI, types of Ecommerce, Benefits and limitations of ecommerce, Cyber law ,Cyber banking, E-payment, Security, Cyber act, Legal and ethical issues in ecommerce, Cybercrime.

### **Text Books:**

1. Computer Fundamentals, V Rajaraman.
2. Computer Fundamentals, P.K Sinha
1. 3. Computers Today, Mc Grow Hill publication.

**BCA**

**SEC-3: (Introduction to LATEX)**

**(LTP:: 1:0:1)**

**3 Credits**

Installation of the software LaTeX, Understanding Latex compilation, Basic Syntax, Writing equations, Matrix, Tables, Page Layout – Titles, Abstract Chapters, Sections, References, Equation references, citation, List making environments, Table of contents, Generating new commands, Figure handling numbering, List of figures, List of tables, Generating index, Packages: Geometry, Hyperref, mathematical equations, symbols, algorithms, algorithmic graphic, color, tilez listing, Classes: article, book, report, beamer, slides, IEEtran. Applications to: Writing Resumae, Writing question paper, Writing articles/ research papers.

### B Sc Programme (CBCS): Computer Science; 2018-19 onwards

Semester	Core DSC	Credits	Elective DSE	Credits	SEC	Credits
I	DSC-3 A	6				
II	DSC-3 B	6				
III	DSC-3 C	6				
IV	DSC-3 D	6				
V			DSE-3 A	6	SEC-1 SEC-2	2 2
VI			DSE-3 B	6	SEC-3 SEC-4	2 2

#### Discipline Specific Courses:

DSC-3 A : Computer Concepts and C Programming (L;T:P::4:0:2)

DSC-3 B : Data Structures and Its Applications (L;T:P::4:0:2)

DSC-3 C : Object Oriented Programming with Java (L;T:P::3:1:2)

DSC-3 D : Database Management Systems (L;T:P::4:0:2)

#### List of electives for both Vth and VIth semesters ( DSE-3 A and DSE-3 B )

Select one of the following electives in both Vth and VIth semester, without repetition.

- i) Numerical and Statistical Analysis (L;T:P::4:0:2)
- ii) Computer Graphics and Animation (L;T:P::4:0:2)
- iii) Data Communication and Computer Networks (L;T:P::4:1:1)
- iv) Web Programming (L;T:P::3:1:2)
- v) .NET Programming (L;T:P::3:1:2)
- vi) Software Engineering (L;T:P::4:2:0)
- vii) System Software and Operating Systems (L;T:P::4:0:2)

#### Skill Oriented Course

SEC-1 :: DTP (Page Maker and CorelDraw) (L;T:P::1:0:1)

SEC-2 :: Cyber Security (L;T:P::1:0:1)

SEC-3 :: Accounting Software (Tally) (L;T:P::1:0:1)

SEC-4 :: Android Programming (L;T:P::1:0:1)