ಅನುವಾದ

ಮೇಲೆ: ಮ.ಎಂ. ಕೊರಿ ಮಧ್ಯ ಶಾಲೆಯನ್ನು ಬಿಭಾಗದ ಅಧ್ಯಕ್ಷರ ವಿದ್ಯಾಭ್ಯಾಸ ಪ್ರಕ್ರಿಯೆಯ ಅನುಮೋದನೆ ಅಧಿಕಾರಿ ಸಾಮರ್ಥ್ಯ ಪಡೆದುಕೊಂಡರು.

ಎಂದರೆ: 1) ಸಾಂಖ್ಯಿಕ ಅಧ್ಯಕ್ಷರ ವಾದಿ ಮಾರ್ಚ್ 13.06.2018.
2) ಮಧ್ಯ ಮೇಧಾ ವಾದಿ ವಾದಿ ಮಾರ್ಚ್ 14.06.2018.
3) ಅಧಿಕಾರಿ ಸಾಮರ್ಥ್ಯ ವಾದಿ ಮಾರ್ಚ್ 26.06.2018.

****

ತಂದು (3) ಸ್ಲೀಕ್ಷರು ಮಾಧ್ಯಮಾಧ್ಯಮದ ವಿದ್ಯಾರ್ಥಿಗಳ ಕಾರ್ಯಕರ್ತೆಗಳ ರೈಲು ರೈಲು II ನಂತರ ಒಟ್ ಸಲ್ಲಿಸಿದ ಸ್ಲೀಕ್ಷರಿಗೆ ಮಾರ್ಚ್ 2018 ಗೆ ಇತರ ವಿದ್ಯಾರ್ಥಿಗಳ ಸ್ಲೀಕ್ಷರಿಗೆ ವಿದ್ಯಾಶಾಲಿಯ ಮುಖ್ಯಾಕಾಶ ಪಡೆದುಕೊಂಡರು.

ಮೇರಿಗೆ, 2018-19ರ ವಿದ್ಯಾರ್ಥಿಗಳ ಅಧ್ಯಕ್ಷರಿಗೆ ಮಾರ್ಚ್ 1.

ದಿನಾಂಕ 2018-19ರ ವಿದ್ಯಾರ್ಥಿಗಳ ಅಧ್ಯಕ್ಷರಿಗೆ ಮಾರ್ಚ್ 1.

ದಿನಾಂಕ 2018-19ರ ವಿದ್ಯಾರ್ಥಿಗಳ ಅಧ್ಯಕ್ಷರಿಗೆ ಮಾರ್ಚ್ 1.

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ನಿದ್ದೆಯ ಮೂಲಕ ಬಿಭಾಗದ ಅಧ್ಯಕ್ಷರಿಗೆ ಮಾರ್ಚ್ 1.


1. ಆಧಿ ಮದ್ಯ ಅಧ್ಯಕ್ಷರ ವಾದಿ ಪ್ರಧಾನ ಮಾರ್ಚ್ 1.
2. ಮಧ್ಯ ಮೇಧಾ ವಾದಿ ವಾದಿ ಪ್ರಧಾನ ಮಾರ್ಚ್ 1.
3. ಅಧಿಕಾರಿ ಸಾಮರ್ಥ್ಯ ಪ್ರಧಾನ ಮಾರ್ಚ್ 1.
4. ಕುನ್ನಚಿಕು, ಮ.ಎಂ. ವಾದಿ ಆನುಮೋದನೆ
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30. ಅಧಿಕಾರಿ ಸಾಮರ್ಥ್ಯ ಆನುಮೋದನೆ
GULBARGA UNIVERSITY, KALABURAGI

DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS FOR BACHELOR OF SCIENCE (B.Sc.)

COMPUTER SCIENCE

(CBCS SCHEME)

(REVISED SYLLABUS WITH EFFECT FROM ACADEMIC YEAR 2018-19 & ONWARDS)

Approved the Syllabus by BOS(UG) on dated 06-06-16 & 07-06-18

BACHELOR OF SCIENCE (B.Sc.) CBCS SYLLABUS

(CBCS Scheme)

(With effect from the academic year 2018-19 and onwards)
## GULBARGA UNIVERSITY KALABURAGI

SCHEME OF STUDY AND EXAMINATION FOR B.Sc. IN COMPUTER SCIENCE UNDER CBCS SCHEME W.E.F. ACADEMIC YEAR 2018-19 AND ONWARDS

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GU.K, B.Sc. CBCS SYLLABUS 2018-19
### FIFTH SEMESTER 2020-21 & ONWARDS

| SEC-1     | (a) Office Automation Tools | 40 | 01(Pr) | 50 | 02 | 1 | - | 2 | 2 |
| SEC-2     | (a) Android Programming     | 40 | 01(Pr) | 50 | 02 | 1 | - | 2 | 2 |
| DSE-1     |                             | 80 | 20    | 100| 03 | 4 | - | - | 4 |
| DSE-2     |                             | 80 | 20    | 100| 03 | 4 | - | - | 4 |
| DSE-3     | (a) Java Programming        | 80 | 20    | 100| 03 | 4 | - | - | 4 |
|           | (b) Database Management     |    |       |    |    |   |   |   |   |
|           | System                     |    |       |    |    |   |   |   |   |
|           | (c) Data Communication      |    |       |    |    |   |   |   |   |
|           | and Networks                |    |       |    |    |   |   |   |   |
|           | (d) Software Engineering    |    |       |    |    |   |   |   |   |

#### PRACTICALS

| DSE-1     |                             | 40 | 10    | 50 | 02 | - | - | 4 | 2 |
| DSE-2     |                             | 40 | 10    | 50 | 02 | - | - | 4 | 2 |
| DSE-3     | Practical-V: (a) Java       | 40 | 10    | 50 | 02 | - | - | 4 | 2 |
|           | Programming Lab             |    |       |    |    |   |   |   |   |
|           | (b) Database Management     |    |       |    |    |   |   |   |   |
|           | System Lab                  |    |       |    |    |   |   |   |   |
|           | (c) Data Communication       |    |       |    |    |   |   |   |   |
|           | and Networks                |    |       |    |    |   |   |   |   |
|           | (d) Software Engineering    |    |       |    |    |   |   |   |   |

#### TOTAL MARKS FOR FIFTH SEMESTER

**550**

### SIXTH SEMESTER 2020-21 & ONWARDS

| SEC-3     | (a) System Administration  | 40 | 10(Pr) | 50 | 02 | 1 | - | 2 | 2 |
|           | and Maintenance             |    |       |    |    |   |   |   |   |
|           | (b) Software Testing        |    |       |    |    |   |   |   |   |
| SEC-4     | (a) MySql (SQL/PI/SQL/)     | 40 | 10(Pr) | 50 | 02 | 1 | - | 2 | 2 |
|           | (b) Information Security     |    |       |    |    |   |   |   |   |
| DSE-4     |                             | 80 | 20    | 100| 03 | 4 | - | - | 4 |
| DSE-5     |                             | 80 | 20    | 100| 03 | 4 | - | - | 4 |
| DSE-6     | (a) Python Programming      | 80 | 20    | 100| 03 | 4 | - | - | 4 |
|           | (b) Web Technologies        |    |       |    |    |   |   |   |   |
|           | (c) Data Mining             |    |       |    |    |   |   |   |   |
|           | (d) Operating System        |    |       |    |    |   |   |   |   |

#### PRACTICALS

| DSE-4     |                             | 40 | 10    | 50 | 02 | - | - | 4 | 2 |
| DSE-5     |                             | 40 | 10    | 50 | 02 | - | - | 4 | 2 |
| DSE-6     | Practical-VI: (a) Python    | 40 | 10    | 50 | 02 | - | - | 4 | 2 |
|           | Programming Lab             |    |       |    |    |   |   |   |   |
|           | (b) Web Technologies Lab    |    |       |    |    |   |   |   |   |
|           | (c) Data Mining Lab         |    |       |    |    |   |   |   |   |
|           | (d) Operating Systems Lab   |    |       |    |    |   |   |   |   |

#### TOTAL MARKS FOR SIXTH SEMESTER

**550**

#### TOTAL MARKS & CREDITS FOR THE COURSE

**3900**

**148**

Note: Course = Paper, AECC: Ability Enhance Course, DSE: Discipline Specific Core Course, SEC=Skill Enhancement Course, DSE= Discipline Specific Elective, L=Lecture, T=Tutorial, P=Practical Additional 2 credits shall be given for the successful completion of two years of NSS/NCC (145+2=148) AECC-1C and AECC-2C shall be approved by the BOS of Environmental Science and Political Science Tutorial/Batch = 20 Students, Practical/Batch = 10 Students, AECC-a, AECC-b paper cover communicative skills. For SEC theory 40 marks, Practical IA 10 marks awarded by the concerned course teacher based on the Practical.
GULBARGA UNIVERSITY, KALABURAGI  
DEPARTMENT OF COMPUTER SCIENCE  
B.Sc./B.C.A./B.A  

Blue print for the core paper and DSE paper setting  

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Question Papers contains 3 sections:  

Section A : 10 Questions of 2 marks, Answer All Questions X 2 = 20 Marks  

Section B : 6 Questions of 5 marks, Answer any 4 Questions X 5 = 20 Marks  

Section C : 6 Questions of 10 marks, Answer any 4 Questions X 10 = 40 Marks  

Total=80 Marks  

Distribution of Marks for Practical:  

1. Writing 2 programs X 10 marks = 20Marks.  
2. Execution of single program 1 X10 = 10 Marks.  
3. Record Book = 05 Marks.  
4. Viva-voce = 05 Marks.  
Total = 40 Marks  

Distribution of Marks for Project work for BCA VI Semester Course  

1. Project Evaluation = 90 Marks.  
2. Viva-voce = 30 Marks.  
3. Internal Marks = 30 Marks  
Total = 150 Marks  

Blue print for SEC paper setting and G.E.( B.A. Course only)  

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Question Papers contains 3 sections:  

Section A: 5 Questions of 2 marks, Answer All Questions X 2= 10 Marks  

Section B : 3 Questions of 5 marks, Answer any 2 Questions X 5= 10 Marks  

Section C : 3 Questions of 10 marks, Answer any 2 Questions X 10= 20 Marks  

Total=40 Marks
DSC 3A: Object Oriented Programming using C++

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20
Credits: 04
Total Teaching Hrs: 60

UNIT I
Programming Concepts: Algorithm and its characteristics, pseudo code / flow chart, program, identifiers, variables, constants, primitive data types, expressions, structured data types, arrays, compilers and interpreters.

UNIT II
Object Oriented Concepts: Abstraction, encapsulation, objects, classes, methods, constructors, inheritance, polymorphism, static and dynamic binding, overloading. Program Development: Object oriented analysis, design, UNIT testing & debugging, system testing & integration, maintenance.

UNIT III
Introduction to structured programming: Data types- Primitive data types, floating data types, character data types, string data types, arithmetic operators and operator precedence, variables and constant declarations, expressions, input using the extraction operator >> and cin, output using the insertion operator << and cout, preprocessor directives, increment (++) and decrement operations (-).

UNIT IV
Writing a C++ program: Input/output statements, relational operators, logical operators and logical expressions, if and if … else statement, switch, case and break statements. “for”, “while” and “do – while” loops, break and continue statement, nested control statement, value returning functions, void functions, value versus reference parameters, local and global variables, static and automatic variables, enumeration type.

References:

Practical-I: DSC 3A: Object Oriented Programming using C++ Lab

Practical: 4 Hrs./ Week
Max Marks: 40
Cont. Assessments. 10
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 3A Object Oriented Programming using C++.

DSC 3B: Data Structures and File Processing

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20
Credits: 04
Total Teaching Hrs: 60

UNIT I
Basic Data Structures: Abstract data structures - Arrays, Stacks, Queues, linked lists and Binary trees, balanced trees.

UNIT II 15 Hrs
Searching: Internal and external searching, Memory Management: Garbage collection algorithms for equal sized blocks, storage allocation for objects with mixed size.

UNIT III 15 Hrs
Physical Devices: Characteristics of storage devices such as disks and tapes, I/O buffering. Basic File System Operations: Create, open, close, extend, delete, read-block, write-block, protection mechanisms.

UNIT IV 15 Hrs
File Organizations: Sequential, indexed sequential, direct, inverted, multi-list, directory systems, Indexing using B-tree, B+ tree.

References:

Practical-II: DSC 3B: Data Structures and File Processing Lab

Practical: 4 Hrs./ Week  
Max Marks: 40  
Credits: 02  
Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC3B Data Structures and File Processing Using C++.

DSC 3C: Numerical Computing

Teaching: 4 Hrs./ Week  
Max Marks: 80  
Total Teaching Hrs: 60

UNIT I 15 Hrs

UNIT II 15 Hrs
Interpolation: Polynomial interpolation, Newton-Gregory, Stirling’s, Bessel’s and Lagrange’s interpolation formula, Newton’s divided differences interpolation formulae.
UNIT III
Numerical Differentiation and Integration: Numerical differentiation and errors in numerical differentiation, Newton-Cotes formulae, trapezoidal rule, Simpson’s rule, Gaussian integration. 15 Hrs

UNIT IV
Numerical Solutions of Ordinary Differential Equations: Picard’s and Taylor’s series, Euler’s and RungeKutta (RK) methods. 15 Hrs

References:

Practical-III: DSC 3C: Numerical Computing Lab
Practical: 4 hrs./ Week
Max Marks: 40
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 3C Numerical Computing Using C++.

DSC 3D: Design and Analysis of Algorithms
Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20

UNIT I
Introduction: RAM model, O (log n) bit model. Review of data structures: Balanced trees, Mergeable sets. Algorithm Design Techniques: Iterative techniques, Divide and conquer, dynamic programming, Greedy algorithms. 15 Hrs

UNIT II
Searching and Sorting Techniques: Review of elementary sorting techniques-selection sort, bubble sort, insertion sort, more sorting techniques-quick sort, heap sort, merge sort, shell sort, external sorting. 15 Hrs

UNIT III
String Processing: KMP, Boyre-Moore, Robin Karp algorithms. 15 Hrs

UNIT IV
Graphs: Analysis of Graph algorithms Depth-First Search and its applications, minimum Spanning Trees and Shortest Paths. 15 Hrs

Lower bounding techniques: Decision Trees, Adversaries, Introduction to randomized algorithms, Random numbers randomized Qsort, randomly Built BST Number Theoretic Algorithms: GCD, Addition and Multiplication of two large numbers. 15 Hrs

References:

Practical-IV: DSC 3D: Design and Analysis of Algorithms Lab

Practical: 4 hrs./ Week
Max Marks: 40
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 3D Design and Analysis of Algorithms Using C++.

SEC 1(a): Office Automation Tools

Teaching: 1 Hrs./ Week
Max Marks: 30 Cont. Assessments. 0
Total Teaching Hrs: 15

UNIT-1

MS-Word: Introduction to word processor, Features of word XP, Special features of word processing software, Getting into Microsoft word XP, Creating new document, Editing the document, Opening existing document, Saving the document, Print the document, File operation in word XP, Creation of tables in word, Create the header or footer, Graphics, Introduction to mail merge, Creating and working with web page, Editing equations, Keyboard shortcut keys.

UNIT-II

MS-Power Point: Introduction, Different uses of power point, creating a presentation slide, Open an existing presentation, Auto layout, Components of power point window, Different views of a slide, Different operations on slide, Adding clip art to a presentation, Slide animation, Slide master, Slide number, Printing a presentation, Charts in power point, List of shortcut keys

References:

Practical IA: SEC 1(a): Office Automation Tools Lab

Practical: 2 Hrs./ Week
Cont. Assessments. 10
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 1(a).

SEC 1(b): PHP Programming

Teaching: 1 Hrs./ Week
Max Marks: 30 Cont. Assessments. 0
Total Teaching Hrs: 15

UNIT 1

Introduction to PHP: PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.), PHP with other technologies, scope of PHP, Basic Syntax, PHP variables and constants, Types of data in PHP, Expressions, scopes of a variable
(local, global), PHP Operators: Arithmetic, Assignment, Relational, Logical operators, Bitwise, ternary and MOD operator, PHP operator Precedence and associativity.

Handling HTML form with PHP HTML: Capturing Form Data, GET and POST form methods, Dealing with multi value fields, Redirecting a form after submission.

UNIT II

PHP conditional events and Loops: PHP IF Else conditional statements (Nested IF and Else), Switch case, while, For and Do While Loop, Goto, Break, Continue and exit.

PHP Functions: Function, Need of Function, declaration and calling of a function, PHP Function with arguments, Default Arguments in Function, Function argument with call by value; call by reference, Scope of Function Global and Local.

String Manipulation and Regular Expression: Creating and accessing String, Searching & Replacing String, Formatting, joining and splitting String, String Related Library functions, Use and advantage of regular expression over built-in function, Use of preg_match(), preg_replace(), preg_split() functions in regular expression.

Array: Anatomy of an Array, Creating index based and Associative array, Accessing array, Looping with Index based array, with associative array using each() and for each(), Some useful Library function.

Practical IA: SEC 1(b): PHP Programming Lab

Practical: 2 Hrs./ Week
Cont. Assessments: 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 1(b) PHP Programming.

SEC 2(a): Android Programming

Teaching: 1 Hrs./ Week
Max Marks: 30
Cont. Assessments: 0
Total Teaching Hrs: 15

UNIT I


OOPs Concepts: Inheritance, Polymorphism, Interfaces, and Abstract class, Threads, Overloading and Overriding, Java Virtual Machine. Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating a android project – Hello Word, run on emulator, Deploy it on USB-connected Android device.

8Hrs

UNIT II

User Interface Architecture: Application context, intents, Activity life cycle, multiple screen sizes.

User Interface Design: Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, Dialog. Database: Understanding of SQLite database, connecting with the database.

References:


Online Reading / Supporting Material:
Practical IA: SEC 2(a): Android Programming lab

Practical: 2 Hrs./Week
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 2(a) Android Programming.

SEC 2(b): XML Programming

Teaching: 1 Hrs./Week
Max Marks: 30 Cont. Assessments. 0

UNIT I

8 Hrs

UNIT II
Other XML Concepts: Scripting XML, XML as Data, Linking with XML. XML with Style: XSL - Style Sheet Basics, XSL basics, XSL style sheets.

References:
2. Michael J. Young, Step by Step XML, Microsoft Press, 2002

Practical IA : SEC 2(b): XML programming Lab

Practical: 2 Hrs./Week
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 2(b) XML Programming.

DSE 3(a): Java Programming

Teaching: 4 Hrs./Week
Max Marks: 80 Cont. Assessments. 20

UNIT I
Introduction to Java - Features of Java - Object Oriented Concepts - Data Types - Variables - Arrays - Operators - Control Statements-Input and output-Scanner and System class-print() and println() methods.
UNIT II 15 Hrs
Classes - Objects - Constructors - Overloading method - Access Control - Static and fixed methods - Inner Classes - String Class - Inheritance - Overriding methods - Using super- Abstract class - Type Wrapper classes for primitive types – Auto boxing and auto Unboxing --Recursion.

UNIT III 15 Hrs

UNIT IV 15 Hrs

References:

Practical-V(a): DSE-3: Java Programming Lab

Practical: 4 Hrs./ Week
Max Marks: 40
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE -3(a) Java Programming.

DSE-3(b): Database Management Systems

Teaching: 4 Hrs./ Week
Max Marks: 80

UNIT I 15 Hrs
Introduction to Databases: Introduction, Traditional File-Based Systems, Database Approach, Roles in the Database Environment, Advantages and Disadvantages of DBMSs, The Three-Level Architecture, Database Languages, Data Models, Functions of a DBMS, Components of a DBMS.

UNIT II 15 Hrs
Enhanced Entity–Relationship Modeling: Specialization/Generalization, Aggregation and Composition.
**Functional Dependencies:** Anomalies, Partial Functional Dependency, Transitive Functional Dependency, Multi Valued Dependency, Join Dependency.


**UNIT III**

15 Hrs

SQL: Introduction, Data Manipulation—Simple Queries, Sorting Results, Using the SQL Aggregate Functions, Grouping Results, Sub-queries, ANY and ALL, Multi-table Queries, EXIST and NOT EXIST, Combining Result Tables, Database Updates.

SQL: The SQL Data Types, Integrity Enhancement Feature–Domain Constraints, Entity Integrity, Referential Integrity, General Constraints, Data Definition—Creating a Database, Creating a Table, Changing a Table Definition, Removing a Table, Creating an Index, Removing an Index, Views—Creating a View, Removing a View, View Resolution, Restrictions on Views, View Updatability, Advantages and Disadvantages of Views, View Materialization, Transactions, Discretionary Access Control—Granting Privileges to Other Users, Revoking Privileges from Users.

**Advanced SQL:** The SQL Programming Language—Declarations, Assignments, Control Statements, Exceptions, Cursors, Subprograms, Stored Procedures, Functions, and Packages, Triggers, Recursion.

**UNIT – IV**

15 Hrs


**Security:** Database Security—Threats, Computer-Based Controls—Authorization, Access Controls, Views, Backup and Recovery, Integrity, Encryption, RAID.

**References:**

1. Thomas M. Connolly, Carolyn E. Begg, Database Systems—A Practical Approach to Design, Implementation, and Management (6e)
2. Sharon Allen, Evan Terry, Beginning Relational Data Modeling
3. Jeffrey A. Hoffer, V. Ramesh, Heikki Topi, Modern Database Management
4. Raghuramakrishna, Johannes Gehrke, Database Management Systems
5. Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database Systems
6. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts

**Practical-V(b): DSE 3: Database Management Systems Lab**

**Practical:** 4 Hrs./ Week

**Max Marks:** 40

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 3(b) Database Management Systems.
**DSE-3(c): Data Communication and Networks**

**Teaching:** 4 Hrs./Week

Max Marks: 80 Cont. Assessments. 20

**UNIT I**


**Transmission Media:** Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon Capacity.

**UNIT II**

**Telephony:** Multiplexing, error detection and correction, Many to one, one to many, WDM, TDM, FDM, circuit switching, packet switching and message switching. Data Link control protocols: Line discipline, flow control, error control, synchronous and asynchronous protocols overview. ISDN: Services, historical outline, subscriber's access, ISDN, Layers, and broadband ISDN.

**UNIT III**

**Devices:** Repeaters, bridges, gateways, routers, The Network Layer, Design Issues, Network Layer Addressing and Routing concepts (Forwarding Function, Filtering Function); Routing Methods (Static and dynamic routing, Distributed routing, Hierarchical Routing); Distance Vector Protocol, Link State protocol.

**UNIT IV**

**Transport and upper layers in OSI Model:** Transport layer functions, connection management, Functions of session layers, Presentation layer, and Application layer.

**References:**

**Practical-V(c): DSE 3: Data Communication and Networks Lab**

Practical: 4 Hrs./Week

Max Marks: 40

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 3(c) Data Communication and Networks.

**DSE 3(d) Software Engineering**

**Teaching:** 4 Hrs./Week

Max Marks: 80 Cont. Assessments. 20

**UNIT I**

**Software engineering:** Evolving Role of Software, Software Engineering, Changing nature of Software, Software Myths, and Terminologies, Role of management in software development Software Process and desired Characteristics.
UNIT II

Software Requirements Analysis & Specifications: Requirements Engineering, Types of Requirements, Feasibility Studies, Requirements Elicitation, Requirements Analysis Documentation, Validation and Management.

UNIT III

Function Oriented Design: Design principles, Module level Concepts, Notation & Specification, Structured Design Methodology, and Verification

UNIT IV

Coding: Programming Principles & Guidelines, Coding Process, Refactoring, Verification.

References:

Practical-V(d): DSE 3: Software Engineering Lab

Practical: 4 Hrs./Week
Max Marks: 40
Cont. Assessments: 10
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 3(d) Software Engineering Using Testing tools.

SEC 3(a): System Administration & Maintenance

Teaching: 1 Hrs./Week
Max Marks: 30
Total Teaching Hrs: 15

UNIT I

Linux: Basics of operating system, services. Installation and configuration, maintenance. What is a Linux Operating system, Kernel, API, cli, gui. Difference between Linux/unix and other operating systems. Features and Architecture Linux features, advantages, disadvantages.

UNIT II

Windows: Windows as operating system, history, versions. PC hardware, BIOS. Devices and drivers. Kernel Configuration and building. Application installation, configuration and

References:
2. Microsoft Windows Operating System Essentials by Tom Carpenter

Practical IA: SEC 3(a): System Administration and Maintenance
Practical: 2 Hrs./Week

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 3(a) System Administration & Maintenance.

SEC 3(b): Software Testing
Teaching: 1 Hrs./Week
Max Marks: 30 Cont. Assessments. 0
UNIT I

UNIT II

References:

Practical IA: SEC 3(b): Software Testing
Practical: 2 Hrs./Week

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 3(b) Software Testing.

SEC 4(a): MySQL
Teaching: 1 Hrs./Week
Max Marks: 30 Cont. Assessments. 0
Credits: 02
Total Teaching Hrs: 15

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UNIT-I

SQL Vs. SQL * Plus: SQL Commands and Data types, Operators and Expressions, Introduction to SQL * Plus. Managing Tables and Data: Creating and Altering Tables (Including constraints), Data Manipulation Command like Insert, update, delete, SELECT statement with WHERE, GROUP BY and HAVING, ORDER BY, DISTINCT, Special operator like IN, ANY, ALL BETWEEN, EXISTS, LIKE Join, Built in functions, Other Database Objects, View, Synonyms, Index.

UNIT-II

Transaction Control Statements: Commit, Rollback, Savepoint. Introduction to PL/SQL: SQL v/s PL/SQL, PL/SQL Block Structure, Language construct of PL/SQL (Variables, Basic and Composite Data type, Conditions looping etc.) TYPE and ROWTYPE, Using Cursor (Implicit, Explicit)

References:

Practical IA : SEC 4(a): MySQL Lab

Practical: 2 Hrs./ Week Cont. Assessments. 10
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 4(a) MySQL.

SEC 4(b): Information Security

Teaching: 1 Hrs./ Week Credits: 02
Max Marks: 30 Total Teaching Hrs: 15
Cont. Assessments. 00
UNIT I

Overview of Security: Protection versus security; aspects of security—data integrity, data availability, privacy; security problems, user authentication. Security Threats: Program threats, worms, viruses, Trojan horse, trap door, stack and buffer overflow, system threats- intruders, communication threats- tapping and piracy.

UNIT II

Cryptography: Substitution, transposition ciphers, symmetric-key algorithms Data Encryption Standard, advanced encryption standards, public key encryption -RSA; Diffie-Hellman key exchange, ECC cryptography, Message Authentication MAC, hash functions.

References:

Practical IA : SEC 4(b): Information Security Lab

Practical: 2 Hrs./ Week Cont. Assessments. 10
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 4(b) Information Security.
DSE 6(a): Python Programming

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20

UNIT I


UNIT II

List, dict, set and generator-comprehensions. User defined functions - variable number of arguments, default parameters, key value pairs as arguments, Data Storage, Data formatting.

UNIT III

Modules, packages and programs, systems, Regular expressions, File Handling, Errors and Exception handling.

UNIT IV

Classes, objects, inheritance, Testing and debugging, GUI Programming, Relational databases, Web Untangled, Concurrency and Networks.

References:
1. Bill Lubanovic, Introducing Python- Modern Computing in Simple Packages, O'Reilly Publication

Practical-VI(a): DSE 6: Python Programming Lab

Practical: 4 Hrs./ Week
Max Marks: 40

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 6(a) Python Programming.

DSE 6(b): Web Technologies

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20

UNIT I

Introduction to Web Design: Introduction to hypertext markup language (HTML), document type definition, creating web pages, graphical elements, lists, hyperlinks, tables, web forms, inserting images, Divisions, Sections.

UNIT II

Customized Features: Cascading style sheets, (CSS) for text formatting and other manipulations, Types, Introduction to DHTML.

UNIT III

JavaScript: Data types, operators, functions, control structures, events and event handling.
UNIT IV  

Bootstrap: Introduction, Environment, a simple web page using bootstrap template, Designing tables, forms, buttons.

References:
6. jQuery Web Application Library, Tutorials Point
5. (http://www.tutorialspoint.com/jquery/jquery_tutorial.pdf)

Practical-VI(b): DSE 6: Web Technologies Lab

Practical: 4 Hrs./ Week  
Max Marks: 40  
Cont. Assessments: 10
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 6(b) Web Technologies.

DSE 6(c): Data Mining

Teaching: 4 Hrs./ Week  
Max Marks: 80 Cont. Assessments. 20  
Total Teaching Hrs: 60

UNIT I  

Introduction - Data mining, importance of Data mining , various kind of data, Data mining Functionalities, Various kinds of Patterns, Pattern Interesting Classification of Data mining Systems, Data mining Tasks, Primitives Integration of Data Mining System, Major issues in Data Mining.

UNIT II  

Data Processing - Process the Data Descriptive Data Summarization – Measuring Central Tendency Dispersion of Data Graphic Displays of – Basic Descriptive Data Summaries Data Cleaning Data Integration and Transformation data Reduction-Data Discrimination - Concept Hierarchy Generation.

UNIT III  

Data Warehouse OLAP Technology An overview - Data Warehouse Multidimensional Data Model Data Warehouse Architecture Data Warehouse Implementation from Data Warehouse to Data mining.

UNIT IV  

Mining – Frequent Patterns Associations Correlations - Basic Concepts Road Map Efficient Scalable Frequent Item set Mining methods Mining – Various Kinds of Association rules Analysis - Association mining to Correlation Constrain Based Association mining.

References:
1. Data Mining (Concepts and Techniques) Second Ed (Chapter 1,2,3,5,11)  
   Author: Jiawei Han and Micheline Kamber Publishers: Morgan Kaufmann Publishers 2.N.P.Gopalan.B.Sivaselvan ,Data Mining Techniques and Trends ,PHI,2009.
2. Data Mining (Next Generation Challenges and Future Directions)Author:  
   Karguta, Joshi, Sivakumar & Yesha Publishers: Printice Hall of India (2007 )
   Eibe Frank Publishers: Morgan Kaufmann Publishers (An imprint of Elsevier)
4. Data Warehousing, Data mining & OLAP (Edition 2004) Author: Alex Benson,

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Practical-VI(c): DSE 6: Data Mining Lab

Practical: 4 Hrs./Week
Max Marks: 40
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 6(c) Data Mining.

DSE 6(d): Operating Systems

Teaching: 4 Hrs./Week
Max Marks: 80 Cont. Assessments. 20
Total Teaching Hrs: 60
Credits: 04

UNIT – I

UNIT – II
Operating System Organization: Factors in operating system design, basic OS functions, implementation consideration; process modes, methods of requesting system services – system calls and system programs.

UNIT – III
Process Management: System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model.

UNIT – IV
Scheduling: Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies. Memory Management: Mapping addresses space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory.

Credits: 04

15Hrs

References:

Practical-VI(d): DSE 6: Operating Systems Lab

Practical: 4 Hrs./Week
Max Marks: 40
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 6(d) Operating Systems.