



GULBARGA UNIVERSITY

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ದಿನಾಂಕ: 3-7-18

ಕ್ರ.ಸಂ.ಗುವಿಕ/ವಿಮವಿ/ಬಿ.ಓ.ಎಸ್/2018-19/ 682

ಅಧಿಸೂಚನೆ

ವಿಷಯ: ಬಿ.ಎಸ್ಸಿ ಗಣಕ ವಿಜ್ಞಾನ ಕೋರ್ಸಿಗಾಗಿ ಸಿಬಿಎಸ್ ಪದ್ಧತಿಯನ್ನು ಅಳವಡಿಸಿಕೊಂಡು
ಅದಕ್ಕನುಗುಣವಾಗಿ ಪಠ್ಯಕ್ರಮವನ್ನು ಜಾರಿಗೊಳಿಸಿದ ಬಗ್ಗೆ.

- ಉಲ್ಲೇಖ: 1) ಸ್ನಾತಕ ಅಧ್ಯಯನ ಮಂಡಳಿಯ ಸಭೆಯ ದಿನಾಂಕ: 13.06.2018.
2) ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ ನಿಕಾಯದ ಸಭೆ ದಿನಾಂಕ: 14.06.2018.
3) ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ಗೊತ್ತುವಳಿ ಸಂಖ್ಯೆ 11 ದಿನಾಂಕ.26.06.2018.

ಉಲ್ಲೇಖ (3) ರಲ್ಲಿನ ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ಗೊತ್ತುವಳಿ ಸಂಖ್ಯೆ 11 ನ್ನು
ಅನುಷ್ಠಾನಗೊಳಿಸುತ್ತ; ಬಿ.ಎಸ್ಸಿ ಗಣಕ ವಿಜ್ಞಾನ I ರಿಂದ VIನೇ ಸೆಮೆಸ್ಟರ ಪಠ್ಯಕ್ರಮವನ್ನು ಅಧ್ಯಯನ ಮಂಡಳಿಯು
ಪರಿಷ್ಕರಿಸಿ ಅನುಮೋದಿಸಿರುತ್ತದೆ. ದಿನಾಂಕ 14.06.2018. ರಂದು ಜರುಗಿದ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ
ನಿಕಾಯದ ಸಭೆಯಲ್ಲಿ ಸದರಿ ಪಠ್ಯಕ್ರಮವನ್ನು 2018-19ನೇ ಸಾಲಿನಿಂದ ಅನ್ವಯವಾಗುವಂತೆ ಜಾರಿಗೊಳಿಸಲು
ಶಿಫಾರಸ್ಸು ಮಾಡಲಾಗಿದೆ.

ಅದರಂತೆ, 2018-19ನೇ ಸಾಲಿನಿಂದ ಅನ್ವಯವಾಗುವಂತೆ ಬಿ.ಎಸ್ಸಿ ಗಣಕ ವಿಜ್ಞಾನ ಸ್ನಾತಕ ಕೋರ್ಸಿನ I
ರಿಂದ VIನೇ ಸೆಮೆಸ್ಟರ ಪಠ್ಯಕ್ರಮವನ್ನು ಪರಿಷ್ಕರಿಸಿ ಜಾರಿಗೊಳಿಸಲಾಗಿದೆ.

ಈ ಮಾಹಿತಿಯನ್ನು ಸಂಬಂಧಪಟ್ಟ ಶಿಕ್ಷಕರ ಹಾಗೂ ವಿದ್ಯಾರ್ಥಿಗಳ ಗಮನಕ್ಕೆ ತರಲು ಸೂಚಿಸಲಾಗಿದೆ.
ಪಠ್ಯಕ್ರಮದ ವಿವರವನ್ನು ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್‌ಸೈಟ್ www.gug.ac.in ದಿಂದ
ಪಡೆಯಬಹುದು.


ಕುಲಸಚಿವರು

ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕಲಬುರಗಿ

ಗೆ,

1. ಮುಖ್ಯಸ್ಥರು, ಗಣಕ ವಿಜ್ಞಾನ ಅಧ್ಯಯನ ವಿಭಾಗ, ಗು.ವಿ.ಕಲಬುರಗಿ.
2. ಎಲ್ಲಾ ಪದವಿ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಂಶುಪಾಲರಿಗೆ.

ಪ್ರತಿಗಳು:

1. ಡೀನ್‌ರು, ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ ನಿಕಾಯ, ಗು.ವಿ.ಕಲಬುರಗಿ ರವರ ಮಾಹಿತಿಗಾಗಿ.
2. ಕುಲಸಚಿವರು (ಮೌಲ್ಯಮಾಪನ), ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕಲಬುರಗಿ ರವರ ಮಾಹಿತಿಗಾಗಿ.
3. ನಿರ್ದೇಶಕರು, ಯೋಜನೆ, ಮೇಲ್ವಿಚಾರಣೆ ಹಾಗೂ ಮೌಲ್ಯಮಾಪನ ಮಂಡಳಿ, ಗು.ವಿ.ಕಲಬುರಗಿ.
4. ಗ್ರಂಥಪಾಲಕರು, ಗು.ವಿ.ಕಲಬುರಗಿ ರವರ ಮಾಹಿತಿಗಾಗಿ
5. ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ ನಿಕಾಯದ ಎಲ್ಲಾ ವಿಭಾಗಗಳ ಮುಖ್ಯಸ್ಥರಿಗೆ
6. ಮುಖ್ಯಸ್ಥರು, ಗಣಕಕೇಂದ್ರ, ಗು.ವಿ.ಕಲಬುರಗಿ ಇವರಿಗೆ ಸದರಿ ಪಠ್ಯಕ್ರಮವನ್ನು ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್‌
ಸೈಟ್ ನಲ್ಲಿ ಪ್ರಕಟಿಸಲು ತಿಳಿಸಲಾಗಿದೆ.
7. ಕುಲಪತಿಗಳ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿ / ಕುಲಸಚಿವರ ಆಪ್ತ ಸಹಾಯಕರ ಮಾಹಿತಿಗಾಗಿ.



ENCLOSER TO THE
ITEM No. [11]

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

Paper Code	Title of the Course	Marks			Duration of Theory / Practical Exam. Hrs.	Teaching Hours/Week			Credits
		Semester	I A	Total		L	T	P	
FIRST SEMESTER 2018-19 & ONWARDS									
AECC-1a	Kannada/MIL-1	80	20	100	03	2	1	-	3
AECC-1b	English-1	80	20	100	03	2	1	-	3
AECC-1C	Environmental Studies	80	20	100	03	3	1	-	4
DSC-1A		80	20	100	03	4	-	-	4
DSC-2A		80	20	100	03	4	-	-	4
DSC-3A	Object Oriented Programming using C++	80	20	100	03	4	-	-	4
PRACTICALS									
DSC-1A		40	10	50	02	-	-	4	2
DSC-2A		40	10	50	02	-	-	4	2
DSC-3A	Practical-I: Object Oriented Programming using C++ Lab	40	10	50	02	-	-	4	2
TOTAL MARKS FOR FIRST SEMESTER				750					28
SECOND SEMESTER 2018-19 & ONWARDS									
AECC-2a	Kannada/MIL-1	80	20	100	03	2	1	-	3
AECC-2b	English-1	80	20	100	03	2	1	-	3
AECC-2C	Indian Constitution	80	20	100	03	3	1	-	4
DSC-1B		80	20	100	03	4	-	-	4
DSC-2B		80	20	100	03	4	-	-	4
DSC-3B	Data Structures and File Processing	80	20	100	03	4	-	-	4
PRACTICALS									
DSC-1B		40	10	50	02	-	-	4	2
DSC-2B		40	10	50	02	-	-	4	2
DSC-3B	Practical-II: Data Structures and File Processing Lab	40	10	50	02	-	-	4	2
TOTAL MARKS FOR SECOND SEMESTER				750					28
THIRD SEMESTER 2019-20 & ONWARDS									
AECC-3a	Kannada/MIL-1	80	20	100	03	2	1	-	3
AECC-3b	English-1	80	20	100	03	2	1	-	3
DSC-1C		80	20	100	03	4	-	-	4
DSC-2C		80	20	100	03	4	-	-	4
DSC-3C	Numerical Computing	80	20	100	03	4	-	-	4
PRACTICALS									
DSC-1C		40	10	50	02	-	-	4	2
DSC-2C		40	10	50	02	-	-	4	2
DSC-3C	Practical-III: Numerical Computing Lab	40	10	50	02	-	-	4	2
TOTAL MARKS FOR THIRD SEMESTER				650					24
FOURTH SEMESTER 2019-20 & ONWARDS									
AECC-4a	Kannada/MIL-1	80	20	100	03	2	1	-	3
AECC-4b	English-1	80	20	100	03	2	1	-	3
DSC-1D		80	20	100	03	4	-	-	4
DSC-2D		80	20	100	03	4	-	-	4
DSC-3D	Design and Analysis of Algorithm	80	20	100	03	4	-	-	4
PRACTICALS									
DSC-1D		40	10	50	02	-	-	4	2
DSC-2D		40	10	50	02	-	-	4	2
DSC-3D	Practical-IV: Design and Analysis of Algorithm Lab	40	10	50	02	-	-	4	2
TOTAL MARKS FOR FOURTH SEMESTER				650					24

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FIFTH SEMESTER 2020-21 & ONWARDS									
SEC-1	(a) Office Automation Tools (b) PHP Programming	40	10(Pr)	50	02	1	-	2	2
SEC-2	(a) Android Programming (b) XML Programming	40	10(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 (b) Database Management System (c) Data Communication and Networks (d) Software Engineering	80	20	100	03	4	-	-	4
PRACTICALS									
DSE-1		40	10	50	02	-	-	4	2
DSE-2		40	10	50	02	-	-	4	2
DSE-3	Practical-V : (a) Java Programming Lab (b) Database Management System Lab (c) Data Communication and Networks Lab (d) Software Engineering Lab	40	10	50	02	-	-	4	2
TOTAL MARKS FOR FIFTH SEMESTER				550					22
SIXTH SEMESTER 2020-21 & ONWARDS									
SEC-3	(a) System Administration and Maintenance (b) Software Testing	40	10(Pr)	50	02	1	-	2	2
SEC-4	(a) MySql (SQL/PISQL) (b) Information Security	40	10(Pr)	50	02	1	-	2	2
DSE-4		80	20	100	03	4	-	-	4
DSE-5		80	20	100	03	4	-	-	4
DSE-6	(a) Python Programming (b) Web Technologies (c) Data Mining (d) Operating System	80	20	100	03	4	-	-	4
PRACTICALS									
DSE-4		40	10	50	02	-	-	4	2
DSE-5		40	10	50	02	-	-	4	2
DSE-6	Practical-VI : (a) Python Programming Lab (b) Web Technologies Lab (c) Data Mining Lab (d) Operating Systems Lab	40	10	50	02	-	-	4	2
TOTAL MARKS FOR SIXTH SEMESTER				550					22
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 (14+2=16) 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.

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GULBARGA UNIVERSITY, KALABURAGI
DEPARTMENT OF COMPUTER SCIENCE
B.Sc./B.C.A./B.A

Blue print for the core paper and DSE paper setting

UNIT	2 Marks Questions	5 marks Questions	10 Marks Questions
I	2	1	2
II	2	1	2
III	3	2	1
IV	3	2	1

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. Writting 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)

B.Sc./B.C.A./B.A

UNIT	2 Marks Questions	5 marks Questions	10 Marks Questions
I	2	1	2
II	3	2	1

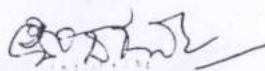
Question Papers contains 3 sections:

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

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

UNIT I

15 Hrs

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

15 Hrs

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

15 Hrs

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

15 Hrs

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:

- 1.M.T. Somashekara, Object Oriented Programming with C++ (2nd Edition), PHI Learning, 2012
- 2.E. Balagurusamy, Object Oriented Programming with C++, McGraw-Hill Publications,
3. Richard Johnson, "An Introduction to Object-Oriented Application Development", Thomson Learning, 2006.

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

Practical: 4 Hrs./ Week

Credits: 02

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

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

UNIT I

15 Hrs



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:

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.
3. Robert L. Kruse and A.J. Ryba, "Data Structures and Program Design in C++", Prentice Hall, Inc., NJ, 1998.
4. B. Stroustrup, "The C++ Programming Language", Addison Wesley, 2004.
5. D.E. Knuth, "Fundamental Algorithms (Vol. I)", Addison Wesley, 1997.

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

Practical: 4 Hrs./ Week

Credits: 02

Max Marks: 40

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

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

UNIT I

15 Hrs

Solution to Transcendental and Polynomial Equations: Iterative methods, bisection method, secant method, Newton-Raphson method, fixed point iteration, methods for finding complex roots.

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**15 Hrs**

Numerical Differentiation and Integration: Numerical differentiation and errors in numerical differentiation, Newton-Cotes formulae, trapezoidal rule, Simpson's rule, Gaussian integration.

UNIT IV**15 Hrs**

Numerical Solutions of Ordinary Differential Equations: Picard's and Taylor's series, Euler's and RungeKutta (RK) methods.

References:

1. K.E. Atkinson, W. Han, "Elementary Numerical Analysis", 3rd Ed., Wiley, 2003.
2. C. Xavier, S.S. Iyengar, "Introduction to Parallel Algorithms", Wiley-Interscience, 1998.
3. B. Bradie, "A Friendly Introduction to Numerical Analysis", Pearson Education, 2007.
4. S.R. Otto and J.P. Denier, "An Introduction to Programming and Numerical Methods in MATLAB", Springer, 2005.
5. M.K. Jain, S.R.K. Iyengar and R.K. Jain, "Numerical Methods for Scientific and Engineering Computation", 7th Ed., New Age International Publishers, 2007.

Practical-III: DSC 3C: Numerical Computing Lab**Practical: 4 hrs./ Week****Credits: 02****Max Marks: 40****Cont. Assessments. 10**

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****Credits: 04****Max Marks: 80 Cont. Assessments. 20****Total Teaching Hrs: 60****UNIT I****15 Hrs**

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.

UNIT II**15 Hrs**

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.

UNIT III**15 Hrs**

String Processing: KMP, Boyre-Moore, Robin Karp algorithms.

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

UNIT - IV**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.

References:

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", Prentice-Hall of India, 2006.
2. J. Kleinberg and E. Tardos, "Algorithms Design", Pearson Education, 2006.

3. S. Baase, "Computer Algorithms: Introduction to Design and Analysis", Addison Wesley, 1999.
4. A.V. Levitin, "Introduction to the Design and Analysis of Algorithms", Pearson Education, 2006.

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

Practical: 4 hrs./ Week

Credits: 02

Max Marks: 40

Cont. Assessments. 10

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

Credits: 02

Max Marks: 30 Cont. Assessments. 0

Total Teaching Hrs: 15

UNIT-I

8Hrs

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

7Hrs

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 :

1. Sushila Madan , Introduction to Essential tools,JBA,2009.
2. Anita Goel, Computer Fundamentals, Pearson, 2012

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

Credits: 01

Max Marks: 30 Cont. Assessments. 0

Total Teaching Hrs: 15

UNIT I

7Hrs

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

8Hrs

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 inbuilt 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

Credits: 01

Max Marks: 30 Cont. Assessments. 0

Total Teaching Hrs: 15

UNIT I

7Hrs

Introduction: History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture. Overview of object oriented programming using Java: 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.

UNIT II

8Hrs

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:

1. Android application development for java programmers. By James C. Sheusi. Publisher: engage Learning, 2013.

Online Reading / Supporting Material:

1. <http://www.developer.android.com>
2. <http://developer.android.com/about/versions/index.html>
3. <http://developer.android.com/training/basics/firstapp/index.html>
4. <http://docs.oracle.com/javase/tutorial/index.htm>

5. <http://developer.android.com/guide/components/activities.html>
6. <http://developer.android.com/guide/components/fundamentals.html>
7. <http://developer.android.com/guide/components/intents-filters.html>
8. <http://developer.android.com/training/multiscreen/screensizes.html>
9. <http://developer.android.com/guide/topics/ui/controls.html>
10. <http://developer.android.com/guide/topics/ui/declaring-layout.html>

Practical IA: SEC 2(a): Android Programming lab

Practical: 2 Hrs./ Week

Cont. Assessments. 10

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

Credits: 02

Max Marks: 30 Cont. Assessments. 0

Total Teaching Hrs: 15

UNIT I

7Hrs

XML Programming introduction: Understanding Mark-up Languages, Introduction to XML and its Goals.

XML Basics: XML Structure and Syntax, Document classes and Rules.

UNIT II

8Hrs

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

References:

1. William J. Pardi , XML in action web technology, Microsoft Press, 1999
2. Michael J. Young, Step by Step XML , Microsoft Press, 2002
3. XML in a Nutshell by Harold, Elliotte Rusty and W. Scott Means. 2004. , 3rd Edition.O'Reilly & Associates. 689 p. ISBN 0596007647.
4. Beginning XML by Danny Ayers, Joe Fawcett, and Liam R. E. Quin, 5th Edition, Wrox Publication, January 2012.
5. Learning XML by Erik T. Ray O'Reilly Media 1st edition 2001.

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

Practical: 2 Hrs./ Week

Cont. Assessments. 10

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

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

UNIT I

15 Hrs

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

GUI components - Common GUI Event types and Listener Interfaces- JoptionPane - JLabel, Jtextfield, JButton, JCheckBox, JTextarea, JComboBox, JList, Jpanel - Mouse Event Handling - Adapter Classes- Key Event Handling.

Mouse Event Handling - Adapter Classes- Key Event Handling. Layout Managers - FlowLayout, BorderLayout, GridLayout.- Graphics contexts and graphics objects - color control - font control -Drawing lines, rectangles and ovals -jslider-using menus with frames.

UNIT IV

15 Hrs

Packages - Access Protection - Importing Packages - Interfaces - Exception Handling - Throw and Throws - Thread - Synchronization - Runnable Interface - Inter thread Communication - Multithreading.- file streams-Sequential file , Random file.

References:

1. Programming in Java - 2nd Edition by C.Muthu, TMH Publication.
2. Java How to Program by Deitel & Deitel - 6 th Edition- PHI Publication 2005..

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

Practical: 4 Hrs./ Week

Credits: 02

Max Marks: 40

Cont. Assessments. 10

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

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

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.

Relational Model: Introduction, Terminology, Integrity Constraints, Views.

The Relational Algebra: Unary Operations, Set Operations, Join Operations, Division Operation, Aggregation and Grouping Operations.

UNIT II

15 Hrs

Entity-Relationship Modeling: Entity Types, Relationship Types, Attributes, Keys, Strong and Weak Entity Types, Attributes on Relationships, Structural Constraints, Problems with ER Models- Fan Traps, Chasm Traps.

Enhanced Entity-Relationship Modeling: Specialization/Generalization, Aggregation and Composition.

Functional-Dependencies: Anomalies, Partial Functional Dependency, Transitive Functional Dependency, Multi Valued Dependency, Join Dependency.

Normalization: The Purpose of Normalization, How Normalization Supports Database Design, Data Redundancy and Update Anomalies, Functional Dependencies in brief, The Process of Normalization, 1NF, 2NF, 3NF, BCNF. The Database Design Methodology for Relational Databases.

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

Transaction Management: Transaction Support-Properties of Transactions, Database Architecture, Concurrency Control-The Need for Concurrency Control, Serializability and Recoverability, Locking Methods, Deadlock, Time Stamping Methods, Multi-version Timestamp Ordering, Optimistic Techniques, Granularity of Data Items, Database Recovery-The Need for Recovery, Transactions and Recovery, Recovery Facilities, Recovery Techniques, Nested Transaction Model.

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. Raghu Ramakrishna, 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
7. C Coronel, S Morris, Peter Rob, Database Systems: Design, Implementation, and Management

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

Practical: 4 Hrs./ Week

Credits: 02

Max Marks: 40

Cont. Assessments. 10

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

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

UNIT I

15 Hrs

Basic Concepts: Components of data communication, distributed processing, Line configuration, topology, transmission mode, and categories of networks. OSI and TCP/IP Models: Layers and their functions, comparison of models. Digital Transmission: Interfaces and Modems: DTE-DCE Interface, modems, cable modems.

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

UNIT II

15 Hrs

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

15 Hrs

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

15 Hrs

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

References:

1. A.S. Tanenbaum, Computer Networks, 4th Ed., Pearson Education Asia, 2003.
2. Behrouz A. Forouzan, Data Communication and Networking, 2nd Ed., Tata McGrawHill.
3. D. E. Comer, Internetworking with TCP/IP, Pearson Education Asia, 2001.
4. William Stallings, Data and Computer Communications, 7th Ed., Pearson education Asia, 2002.
3. Loney and Koch, Oracle 10g: The Complete Reference, Tata McGraw Hill, 2006.
4. David Flanagan, Java Script, The Definitive Guide, O'Reilly Media, 2006.
5. Marty Hall, Larry Brown, and Yaakov Chaikin, Core Servlets and Java ServerPages: Core Technologies (Vol. II), 2nd Ed., Sun Microsystems Press, 2006.
6. S.K. Singh, Database Systems Concepts, Design and Applications, Pearson Education 2006.

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

Practical: 4 Hrs./ Week

Credits: 02

Max Marks: 40

Cont. Assessments. 10

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

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

UNIT I

15 Hrs

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.

Software Life Cycle Models: Water Fall Model, Incremental Process Model, Evolutionary Process Models, Unified Process, Comparison of Models, Other software Processes, Selection of a Model.

UNIT II **15 Hrs**

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

Software Architecture: Views, Component & Connector View and its architecture style, Architecture Vs Design, Deployment View & Performance Analysis, Documentation, and Evaluation.

UNIT III **15 Hrs**

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

Object Oriented Design: OO Analysis & Design, OO Concepts, Design Concepts, UML – Class Diagram, Sequence & Collaboration Diagram, Other diagrams & Capabilities, Design Methodology, Dynamic and Functional Modelling, Internal Classes & Operations.

UNIT IV **15 Hrs**

Detailed Design: PDL, Logic/Algorithm Design, State Modelling of Classes, Verification: Design Walkthroughs, Critical Design Review, Consistency Checkers.

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

References:

1. Pankaj Jalote, "An Integrated Approach to Software Engineering", 3rd Edition, Narosa Publishing House, 2005.
2. K.K. Aggrawal and Yogesh Singh, "Software Engineering", 3rd Edition, New Age International (P) Ltd, 2008.
3. Pressman, R.S., "Software Engineering – A Practitioner's Approach", 3rd Edition, McGraw Hills, 2008.
4. Mall Rajib, "Fundamentals of Software Engineering", PHI, New Delhi, 2005.

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

Practical: 4 Hrs./ Week

Credits: 02

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

Credits: 02

Max Marks: 30 Cont. Assessments. 0

Total Teaching Hrs: 15

UNIT I **7 Hrs**

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 **8Hrs**

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

Maintenance, Server services and Client services, Difference between WindowsXP/windows7 and Windows server 2003/2008.

References:

1. Linux Administration: A Beginner's Guide 6th Edition by Wale Soyinka Publisher: Mcgraw Higher Ed
2. Microsoft Windows Operating System Essentials by Tom Carpenter

Practical IA: SEC 3(a): System Administration and Maintenance

Practical: 2 Hrs./ Week

Cont. Assessments. 10

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

Credits: 02

Max Marks: 30 Cont. Assessments. 0

Total Teaching Hrs: 15

UNIT I

8Hrs

Introduction: Strategic Approach to Software Testing, Test Strategies for Conventional Software, Validation Testing, System Testing, Basic Terminologies, V Shaped Software Lifecycle Model.

Functional Testing / Black-box Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing.

UNIT II

7Hrs

Structural Testing / White-box Testing, Basis Path Testing, Program Graph, DD Path graph, Cyclomatic Complexity, Graph Matrices, Control Flow Testing: Statement Coverage, Branch Coverage, Condition Coverage, Path Coverage.

References:

1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, Seventh Edition, Mc Graw Hill Education. 2009.
2. Yogesh Singh, Software Testing, Cambridge University Press, 2011.
3. Software Testing Effective Methods, Tools and Techniques, Renu Rajani and Pradeep Oak, Tata McGraw-Hill

Practical IA: SEC 3(b): Software Testing

Practical: 2 Hrs./ Week

Cont. Assessments. 10

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

Credits: 02

Max Marks: 30 Cont. Assessments. 0

Total Teaching Hrs: 15

UNIT-I

7Hrs

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

8Hrs

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:

1. Baron Schwartz, High Performance MySQL, O'Reilly, 2012.
2. Vikram Vaswani, The Complete Reference MySQL, McGraw Hill Educations.

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 Cont. Assessments. 00

Total Teaching Hrs: 15

UNIT I

8Hrs

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

7Hrs

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:

1. W. Stallings, Cryptography and Network Security Principles and Practices, 4th Ed., Prentice-Hall of India, 2006.
2. C. Pfleeger and SL. Pfleeger, Security in Computing, 3rd Ed., Prentice-Hall of India, 2007.
3. D. Gollmann, Computer Security, John Wiley and Sons, NY, 2002.
4. J. Piwprzyk, T. Hardjono and J. Seberry, Fundamentals of Computer Security, Springer-Verlag Berlin, 2003.
5. J.M. Kizza, Computer Network Security, Springer, 2007.
6. M. Merkow and J. Breithaupt, Information Security: Principles and Practices, Pearson Education, 2006.

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

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

UNIT I

15Hrs

Introduction: Program Structure – output function – variables, constants, data types, type operators and expressions – control structures – input function . Data structures – str, list, tuple, dict, set.

UNIT II

15Hrs

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

15Hrs

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

UNIT IV

15Hrs

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
2. Allen Downey, Jeffrey Elkner, Chris Meyers, How to Think Like a Scientist –Learning with Python, Green Tea Press, 2002, First Edition.
3. Charles Dierbach, Introduction to Computer Science Using Python, Wiley Publication.
4. Magnus Lie Hetland, Beginning Python, From Novice to Professional, - Second Edition, APress Publication
5. Allen B. Downey, Think Python-How to think like a computer scientist, first Edition, O'Reilly Publication.

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

Practical: 4 Hrs./ Week

Credits: 02

Max Marks: 40

Cont. Assessments. 10

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

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

UNIT I

15Hrs

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

15Hrs

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

UNIT III

15Hrs

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

Query: Introduction, Basics, Selectors, Attributes.

UNIT IV

15Hrs

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

References:

1. Ivan Bayross, "Web Enabled Commercial Application Development Using Html, Dhtml,javascript", Perl CGI, BPB Publications, 2009.
2. Ivan Bayross, "Web Enabled Commercial Application Development Using Html, Dhtml,javascript", Perl CGI, BPB Publications, 2009.
3. BIG Java Cay Horstmann, Wiley Publication , 3rd Edition., 2009.
4. David Flanagan, "jQuery, Pocket Reference", O'Reilly, 2011.
5. Jake Spurlock, "Bootstrap", O'Reilly, 2013.
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

Credits: 02

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

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

UNIT I

15Hrs

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

15Hrs

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

15Hrs

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

15Hrs

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.
3. Data Mining (Next Generation Challenges and Future Directions)Author :
Karguta, Joshi, Sivakumar & Yesha Publishers : Printice Hall of India (2007)
4. Data Mining (Practical Machine Learning Tools and Techniques (Second Edition) Author : Ian H. Witten & Eibe Frank Publishers : Morgan Kaufmann Publishers (An imprint of Elsevier)
5. Data Warehousing, Data mining & OLAP (Edition 2004) Author : Alex Benson,

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

Practical: 4 Hrs./ Week

Credits: 02

Max Marks: 40

Cont. Assessments. 10

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

Credits: 04

Max Marks: 80 Cont. Assessments. 20

Total Teaching Hrs: 60

15Hrs

UNIT – I

Introduction: System Software, Resource Abstraction, OS strategies, Types of operating systems - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems.

15Hrs

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.

15Hrs

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.

15Hrs

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. .

References:

1. A Silberschatz, P.B. Galvin, G. Gagne, "Operating Systems Concepts", 8th Edition, John Wiley Publications 2008.
2. A.S. Tanenbaum, "Modern Operating Systems", 3rd Edition, Pearson Education 2007.
3. G. Nutt, "Operating Systems: A Modern Perspective", 2nd Edition Pearson Education 1997.
4. W. Stallings, "Operating Systems, Internals & Design Principles", 5th Edition, Prentice Hall of India. 2008.
5. M. Milenkovic, "Operating Systems -Concepts and design", Tata McGraw Hill 1992.

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


Practical: 4 Hrs./ Week

Credits: 02

Max Marks: 40

Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 6(d) Operating Systems.



CHAIRMAN
Dept. of Computer Science
Tulsi Baba University, Gorakhpur