



KARNATAK UNIVERSITY, DHARWAD
ACADEMIC (S&T) SECTION
ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಧಾರವಾಡ
ವಿದ್ಯಾಮಂಡಳ (ಎಸ್&ಟಿ) ವಿಭಾಗ



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NAAC Accredited
'A' Grade 2014

website: kud.ac.in

No.KU/Aca(S&T)/RPH-394A/2021-22/1155

Date: 29 OCT 2021

ಅಧಿಸೂಚನೆ

ವಿಷಯ: 2021-22ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಎಲ್ಲ ಸ್ನಾತಕ ಕೋರ್ಸುಗಳಿಗೆ 1 ಮತ್ತು 2ನೇ ಸೆಮಿಸ್ಟರ್
NEP-2020 ಮಾದರಿಯ ಪಠ್ಯಕ್ರಮವನ್ನು ಅಳವಡಿಸಿರುವ ಕುರಿತು.

- ಉಲ್ಲೇಖ: 1. ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿಗಳು(ವಿಶ್ವವಿದ್ಯಾಲಯ 1) ಉನ್ನತ ಶಿಕ್ಷಣ ಇಲಾಖೆ ಇವರ ಆದೇಶ ಸಂಖ್ಯೆ: ಇಡಿ 260 ಯುಎನ್ಇ 2019(ಭಾಗ-1), ದಿ:7.8.2021.
2. ವಿಶೇಷ ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ನಿರ್ಣಯ ದಿನಾಂಕ: 19.08.2021
3. ಈ ಕಚೇರಿ ಸುತ್ತೋಲೆ ಸಂ.No. KU/Aca(S&T)/RPH-394A/2021-22/18 ದಿ:21.08.2021.
4. ಸರ್ಕಾರಿ ಆದೇಶ ಸಂ ಇಡಿ 260 ಯುಎನ್ಇ 2019(ಭಾಗ-1),ಬೆಂಗಳೂರು ದಿ. 15.9.2021.
5. ಎಲ್ಲ ಅಭ್ಯಾಸಸೂಚಿ ಮಂಡಳಿ ಸಭೆಗಳ ನಡವಳಿಗಳು
6. ಎಲ್ಲ ನಿಖಾಯಗಳ ಸಭೆಗಳು ಜರುಗಿದ ದಿನಾಂಕ: 24,25-09-2021.
7. ವಿಶೇಷ ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ನಿರ್ಣಯ ಸಂಖ್ಯೆ: 01 ದಿನಾಂಕ: 28.9.2021.
8. ಈ ಕಚೇರಿ ಸುತ್ತೋಲೆ ಸಂ.No. KU/Aca(S&T)/RPH-394A/2021-22/954 ದಿ:30.09.2021.
9. ಎಲ್ಲ ನಿಖಾಯದ ಡೀನರು / ಸಂಪನ್ಮೂಲ ತಜ್ಞರ ಸಭೆ ದಿನಾಂಕ 21.10.2021.
10. ಎಲ್ಲ ಸ್ನಾತಕ ಅಭ್ಯಾಸಸೂಚಿ ಮಂಡಳಿ ಅಧ್ಯಕ್ಷರುಗಳ ಸಭೆ ದಿನಾಂಕ 22.10.2021.
11. ವಿಶೇಷ ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ನಿರ್ಣಯ ಸಂಖ್ಯೆ: 01 ದಿನಾಂಕ: 27.10.2021.
12. ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಆದೇಶ ದಿನಾಂಕ: 29-10-2021

ಮೇಲ್ಕಾಣಿಸಿದ ವಿಷಯ ಹಾಗೂ ಉಲ್ಲೇಖಗಳನ್ವಯ ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಆದೇಶದ ಮೇರೆಗೆ, 2021-22ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಅನ್ವಯವಾಗುವಂತೆ, ಎಲ್ಲ B.A./ BPA (Music)/BVA/ BTM/ BSW/ B.Sc./B.Sc. Pulp & Paper Science/ B.Sc. (H.M)/ BCA/ B.A.S.L.P./ B.Com/ B.Com (CS)/ & BBA ಸ್ನಾತಕ ಕೋರ್ಸುಗಳ 1 ಮತ್ತು 2ನೇ ಸೆಮಿಸ್ಟರ್ಗಳಿಗೆ NEP-2020 ರಂತೆ ವಿಶೇಷ ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ಅನುಮೋದಿತ ಪಠ್ಯಕ್ರಮಗಳನ್ನು ಈಗಾಗಲೇ ಪ್ರಕಟಪಡಿಸಿದ್ದು, ಮುಂದೆ ದಿನಾಂಕ 04.10.2021 ವರೆಗೆ ಸರಕಾರವು ಕಾಲಕಾಲಕ್ಕೆ ನೀಡಿದ ನಿರ್ದೇಶನಗಳನ್ನು ಅಳವಡಿಸಿಕೊಂಡು ದಿನಾಂಕ 27.10.2021 ರಂದು ಜರುಗಿದ ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯಲ್ಲಿ ಅನುಮೋದನೆ ಪಡೆದು ಕ.ವಿ.ವಿ. ಅಂತರ್ಜಾಲ www.kud.ac.in ದಲ್ಲಿ ಭಿತ್ತರಿಸಲಾಗಿದೆ. ಸದರ ಪಠ್ಯಕ್ರಮಗಳನ್ನು ಕ.ವಿ.ವಿ. ಅಂತರ್ಜಾಲದಿಂದ ಡೌನ್‌ಲೋಡ್ ಮಾಡಿಕೊಳ್ಳಲು ಸೂಚಿಸುತ್ತ ವಿದ್ಯಾರ್ಥಿಗಳ ಹಾಗೂ ಸಂಬಂಧಿಸಿದ ಎಲ್ಲ ಬೋಧಕರ ಗಮನಕ್ಕೆ ತಂದು ಅದರಂತೆ ಕಾರ್ಯಪ್ರವೃತ್ತರಾಗಲು ಕವಿವಿ ಅಧೀನದ/ಸಂಲಗ್ನ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ ಸೂಚಿಸಲಾಗಿದೆ.

ಅಡಕ: ಮೇಲಿನಂತೆ
ಗೆ,

ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವ್ಯಾಪ್ತಿಯಲ್ಲಿ ಬರುವ ಎಲ್ಲ ಅಧೀನ ಹಾಗೂ ಸಂಲಗ್ನ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ. (ಕ.ವಿ.ವಿ. ಅಂತರ್ಜಾಲ ಹಾಗೂ ಮಿಂಚಂಚೆ ಮೂಲಕ ಬಿತ್ತರಿಸಲಾಗುವುದು)

ಪ್ರತಿ:

1. ಕುಲಪತಿಗಳ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
2. ಕುಲಸಚಿವರ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
3. ಕುಲಸಚಿವರು (ಮೌಲ್ಯಮಾಪನ) ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
4. ಅಧೀಕ್ಷಕರು, ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ / ಗೌಪ್ಯ / ಜಿ.ಎ.ಡಿ. / ವಿದ್ಯಾಂಡಳ (ಪಿ.ಜಿ.ಪಿ.ಎಚ್.ಡಿ) ವಿಭಾಗ, ಸಂಬಂಧಿಸಿದ ಕೋರ್ಸುಗಳ ವಿಭಾಗಗಳು ಪರೀಕ್ಷಾ ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
5. ನಿರ್ದೇಶಕರು, ಕಾಲೇಜು ಅಭಿವೃದ್ಧಿ / ವಿದ್ಯಾರ್ಥಿ ಕಲ್ಯಾಣ ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.

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ಕುಲಸಚಿವರು.



KARNATAK UNIVERSITY, DHARWAD

04 - Year BCA (Hons.) Program

SYLLABUS

[Effective from 2021-22]

DISCIPLINE SPECIFIC CORE COURSE (DSCC) FOR SEM I & II,

OPEN ELECTIVE COURSE (OEC) FOR SEM I & II and

SKILL ENHANCEMENT COURSE (SEC) FOR SEM I

AS PER N E P - 2020

Karnatak University, Dharwad
Four Years Under Graduate Program in Computer Applications for BCA (Hons.)
Effective from 2021-22

Sem	Type of Course	Theory/ Practical	Paper Code	Paper Title	Instruction hour per week	Total hours of Syllabus / Sem	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks	Credits
I	DSCC 1	Theory	BCA-1.1	Introduction to Algorithms	04hrs	56	02 hrs	40	60	100	04
		Practical	BCA-1.2	Algorithms Lab	04 hrs	52	03 hrs	25	25	50	02
	DSCC 2	Theory	BCA-1.3	Introduction to Linux	04hrs	56	02 hrs	40	60	100	04
		Practical	BCA-1.4	Linux Lab	04 hrs	52	03 hrs	25	25	50	02
	OEC-1	Theory	BCA-1.5	Statistical Data Analysis using SPSS	03 hrs	42	02 hrs	40	60	100	03
	SEC-1	Practical	BCA-1.6	Fundamentals of Digital Logic	03 hrs	30	02 hrs	25	25	50	02
II	DSCC 3	Theory	BCA-2.1	Data Structures	04 hrs	56	02 hrs	40	60	100	04
		Practical	BCA-2.2	Data Structures Lab	04 hrs	52	03 hrs	25	25	50	02
	DSCC 4	Theory	BCA-2.3	Discrete Mathematical Structure	04hrs	56	02 hrs	40	60	100	04
		Practical	BCA-2.4	DMS Lab	04 hrs	52	03 hrs	25	25	50	02
	OEC-2	Theory	BCA-2.5	Introduction to Financial Accounting using Tally	03 hrs	42	02 hrs	40	60	100	03
Details of the other Semesters will be given later											

Name of Course (Subject): Computer Applications

Programme Specific Outcome (PSO):

On completion of the 03/ 04 years Degree in **BCA** students will be able to:

- PSO 1** : To provide young men and women with required knowledge and necessary skills to get rewarding careers into the changing world of information technology.
- PSO 2** : To provide a foundation of computing principles and business practices for effectively using/managing information systems and enterprise software.
- PSO 3** : To specialize in legacy applications, system software or mobile application.
- PSO 4** : Think of new approaches for solving problem in different domains.
- PSO 5** : To caters the needs of managing the business application.
- PSO 6** : Be in a position to develop industrial applications.

BCA Semester – I

Subject: Computer Applications
Discipline Specific Course (DSC)

The course DSCC 1 in I semester has two papers (Theory Paper –I for 04 credits & Practical Paper -II for 2 credits) for 06 credits: Both the papers are compulsory. Details of the courses are as under.

Course No.1 (Theory): Title of the Course (Theory) : Introduction to Algorithms

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course-01	DSCC	Theory	04	04	56 hrs	2hrs	40	60	100

Course Outcome (CO):

After completion of course (Theory), students will be able to:

- CO 1** : Familiarize with fundamental concepts and computer programming.
- CO 2** : Learn fundamental concepts of programming by developing and executing programs in C.
- CO 3** : Focuses on the structured program.
- CO 4** : Various constructs and their syntax.

Syllabus- Course 1(Theory): Introduction to Algorithms	Total Hrs: 56
Unit-I	14 hrs
<p>Basics of Programming- Definition and Characteristics of Computer, Block diagram of Computer, Compiler, Interpreter, Linker, Loader, Algorithm, Flowchart, Testing and Execution. Examples of flow charts and algorithms Largest of three numbers, reversing the digits of an integer, GCD of two integers, generating prime numbers, computing nth Fibonacci numbers, finding Even and Odd numbers.</p> <p>Programming Tokens: Keywords, Identifiers, Constants, Variables, Data types, defining symbolic constants, Simple Programs.</p>	
Unit-II	14 hrs
<p>Programming Concepts: Operators & Expression: Arithmetic, relational, logical, bitwise, unary, assignment, shorthand assignment operators, conditional operators and increment and decrement operators, Special operators, Type Conversion in expressions, Operator precedence, Mathematical functions.</p> <p>Input/output Functions: Unformatted & formatted I/O functions.</p> <p>Branching and Looping: Simple 'if' statement, Nested if Statement, Ladder 'if-else' statement. The 'Switch' statement, GOTO statement. Looping: for, while, do-while loop, Nested loops and jumps in loops - break, continue statement.</p>	

Unit-III	14 hrs
Arrays, Strings and Functions: Definition, types, initialization, processing an array, passing arrays to functions, Array of Strings. Strings: String constant and variables, Declaration and initialization of string, Input/output of string data, String Handling Functions: strlen, strcat, strcmp, strcpy, strcmp. Functions: Definition, types of user defined functions, prototype, Local and global variables, passing parameters, recursion.	
Unit-IV	14 hrs
Advanced Algorithms: Introduction, the problem solving aspects, Top-down design, Implementation of Algorithms. Exchanging the values of two variables, Counting, Summation of set of Numbers, Factorial Computation, Generation of Fibonacci Sequence, Array Order Reversal, Array Counting, Finding the Maximum Number in a Set, Removal of Duplicates from an Ordered Array, Partitioning an Array, Finding the k^{th} Smallest Element.	

Books recommended.

Text Books

1. Balaguruswamy: Programming in ANSI C, Tata Mc Graw-Hill.
2. Brain W.Karningham and Dennis Ritchie: The C Programming Language, PHI.
3. R.G.Dromey: How to Solve it by Computer, Pearson Education, ISBN 978-81-317-0562-9.

References

1. V. Rajaraman: Fundamentals of Computers, PHI (EEE).
2. Kamthane, Programming with ANSI and Turbo C, Pearson Education, Asia.
3. Herbert Schildt: C. The complete reference, 4th edition.
4. Yeshwant Kanetkar: Let us C, BPB.

BCA Semester – I

Subject: Computer Applications
Discipline Specific Course (DSC)

Course No.1 (Practical): Title of the Course (Practical) : Algorithm Lab

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course-01	DSCC	Practical	02	04	52 hrs	3hrs	25	25	50

Course Outcome (CO):

After completion of course (Practical), students will be able to:

CO 1 : Understand the basics of programming by executing the simple programming

CO 2 : Be able to design & execution of code.

CO 3 : Have practical knowledge of arrays, strings & functions

List of the Experiments for 52 hrs / Semesters

1. Find the area of a circle and area of a triangle given three sides.
2. Largest of three numbers.
3. Reversing the digits of an integer.
4. GCD of two integers.
5. Generating prime numbers.
6. Computing nth Fibonacci numbers.
7. Finding Even and Odd numbers.
8. Exchanging the values of two variables.
9. Counting: Print number from 100 to 200 which are divisible by 7 and display their sum and count using for loop.
10. Summation of set of Numbers.
11. Factorial Computation.
12. Generation of Fibonacci sequence.
13. Array Order Reversal.
14. Finding the Maximum Number in a Set.
15. Removal of Duplicates from an Ordered Array.
16. Partitioning an Array.
17. Finding the Smallest Element.
18. Read N (minimum 5) students marks and find number of students passed and fail depending on the marks.
19. Count the number of vowels, consonants and special characters in a given sentence.
20. To find the addition and subtraction of two matrices using function.

General instructions:

Implement all the programs using C Language

Scheme of Practical Examination (distribution of marks): 25 marks for Semester end examination

- 1. 7 Marks (Program 1 + Execution without error)**
- 2. 7 Marks (Program 2 + Execution without error)**
- 3. Viva 6Marks**
- 4. Journal 5 Marks**

Total 25 marks

Note: Same Scheme may be used for IA (Formative Assessment) examination

BCA Semester – I

Subject: Computer Applications
Discipline Specific Course (DSC)

The course DSCC 2 in I semester has two papers (Theory Paper –I for 04 credits & Practical Paper -II for 2 credits) for 06 credits: Both the papers are compulsory. Details of the courses are as under.

Course No.2 (Theory): Title of the Course (Theory) : Introduction to Linux

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course-02	DSCC	Theory	04	04	56 hrs	2hrs	40	60	100

Course Outcome (CO):

After completion of course (Theory), students will be able to:

- CO1** : Be familiar with fundamentals of Linux operating system.
- CO2** : To learn the concepts of files and file organization.
- CO3** : To learn the mechanisms involved in ownership of files and file attributes
- CO4** : To gain the knowledge on vi editor and regular expressions
- CO 5** : To know the techniques of shell programming.

Syllabus- Course 2(Theory): Introduction to Linux	Total Hrs: 56
Unit-I	14 hrs
Introduction to Unix: Brief History, What is Unix?, Unix Components, Using Unix, Commands in Unix, Some Basic Commands, Getting Help, Command Substitution, Giving Multiple Commands, Aliases. Files and File Organization: Unix Files, Categories of Files, Hidden Files, File System, Path Names, Home Directory, Directory Commands, File Related Commands, Wild Cards, Displaying the Contents of a File, Printing of Files, Comparing Files.	
Unit-II	14 hrs
File Attributes and Permissions: Ownership of Files, File Attributes, File Command, Changing File Permission, Changing the Owner of a File, Changing the group of a File, Times Associated with a File, umask Command. Standard I/O, Redirection Pipes and Filters: Standard I/O, Redirection, Pipe and Pipeline, Filter, tee command, Terminal files, Sample Database, Handling Columns and Fields, sort command, uniq command, tr command.	
Unit-III	14 hrs
The vi Editor: vi Editor, Editing with vi, Moving the Cursor, Editing, Copying and Moving Text, Pattern Searching, Repeating the Last Editor Command, Undoing Commands, Joining Lines, Writing Selected Lines onto a Separate File, Using the Shell from vi, Configuring the vi Environment. Regular Expressions : grep Family of Commands and sed : Regular Expressions, grep Family, egrep Command, fgrep Command, Stream Editor-sed.	

Unit-IV	14 hrs
Shell Programming : Shell Variables, export Command, .profile File – A Script Run during Starting, The First Shell Script, read Command, Positional Parameters, The \$? Variable – Knowing the Exit Status, More about the set Command, exit Command, Branching Control Structures, Loop-Control Structures, continue and break Statements, expr Command, Real Arithmetic in Shell Programs, The here Document (<<), sleep Command, Debugging Scripts, script Command, eval Command, exec Command.	

Books recommended.

Text Books

1. M.G.Venkateshmurthy: Introduction to Unix & Shell Programming, Pearson Education.

References

1. John Goerzen: Linux Programming Bible, IDG Books, New Delhi.
2. Sumitabha Das: Your Unix - The Ultimate Guide, TMH.
3. Richard Petersen: The Complete Reference – Linux, McGraw-Hill
4. Yashwant Kanetkar: Unix & Shell programming – BPB

BCA Semester – I

Subject: Computer Applications
Discipline Specific Course (DSC)

Course No.2 (Practical): Title of the Course (Practical): **Linux Lab**

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course-02	DSCC	Practical	02	04	52 hrs	3hrs	25	25	50

Course Outcome (CO):

After completion of course (Practical), students will be able to:

CO 1 : Use basics of fundamental ability which are required again & again on daily basis to work on modern operating system.

CO 2 : Write useful shell scripts, which enhance the usefulness of computers

CO 3 : Understand basics of various OS related concept like files, directories, Kernel etc.,

List of the Experiments for 52 hrs / Semesters

1. Study Experiment- UNIX basics
2. Basic Shell Programming (Fibonacci Series generation, Factorial of a given number, Checking for Armstrong number)
3. Designing a Arithmetic calculator
4. Generation of Multiplication table
5. Base Conversion (Decimal to Binary, Binary to Decimal)
6. Finding the information about the Login name and File name.
7. Write a shell script to exchange the contents of two variables.
8. Write a shell script, which accepts three subject marks scored by a student and declare the result.
9. Write a shell script program to find area of a square, rectangle, circle and triangle.
10. Write a shell script to print integer numbers from 1 to 20.
11. Write a shell script to perform arithmetic operation on two number depending on +, -, * and /.
12. Write an interactive shell script to display a menu and perform the following task:
 - i. Renaming a file
 - ii. Deleting a file
 - iii. Copying a file
 - iv. Exit
13. Write a shell script which counts the number of lines in a file.
14. Write a shell script to accept three command line arguments and display each one of them.
15. Write a c program to a. Display the PID of parent and PID of child. b. Copy the contents of one file into the other using command line arguments.
16. Write a shell script program to check whether the given file is present in a directory and check what is all the permission given for the owner.
17. Write a shell script program to read 2 filenames and check which 1 is newer and which is older.
18. Write a shell script program to find the number of directory files and ordinary files in the current directory.
19. Write a shell script program to delete zero sized file from current directory.
20. Write a shell script program to calculate Gross salary from basic, DA=20% and HRA=10%.

General instructions:

Scheme of Practical Examination (distribution of marks): 25 marks for Semester end examination

1. 7 Marks (Program 1 + Execution without error)
2. 7 Marks (Program 2 + Execution without error)
3. Viva 6 Marks
4. Journal 5 Marks

Total 25 marks

Note: Same Scheme may be used for IA (Formative Assessment) examination

BCA Semester – I

**Subject: Computer Applications
Open Elective Course (OEC-1)**

(OEC for other Degree students and the students of BCA where exclusive BCA Programme working as single faculty)

OEC-1: Title of the Course : STATSTICAL DATA ANALYSIS USING SPSS

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
OEC-1	OEC	Theory	03	03	42 hrs	2hrs	40	60	100

Course Outcome (CO):

After completion of course, students will be able to:

- CO 1** : To develop data handling ability of students.
- CO 2** : To develop diagrammatic representation of the data.
- CO 3** : To create awareness of descriptive statistics.
- CO 4** : To acquire practical skills related to regression analysis.

Syllabus- OEC: STATSTICAL DATA ANALYSIS USING SPSS	Total Hrs: 42
Unit-I	14 hrs
Data handling: open SPSS data file – save – import from other data source – data entry – labeling for dummy numbers - recode in to same variable – recode in to different variable – transpose of data – insert variables and cases – merge variables and cases. Data handling: Split – select cases – compute total scores – table looks – Changing column - font style and sizes.	
Unit-II	14 hrs
Diagrammatic representation: Simple Bar diagram – Multiple bar diagram – Sub-divided Bar diagram - Percentage diagram - Pie Diagram – Frequency Table – Histogram – Scatter diagram – Box plot.	
Unit-III	14 hrs
Descriptive Statistics: Mean, Median, Mode, SD- Skewness- Kurtosis. Correlation – Karl Pearson’s and Spearman’s Rank Correlation, Regression analysis: Simple and Multiple Regression Analysis [Enter and stepwise methods].	

Books recommended.

Text Books

1. Clifford E.Lunneborg (2000). Data analysis by resampling: concepts and applications. Dusbury Thomson learning. Australia.
2. Everitt, B.S and Dunn, G (2001). Applied multivariate data analysis. Arnold London.

References

1. Jeremy J. Foster (2001). Data analysis using SPSS for windows. New edition. Versions 8-10. Sage publications. London.
2. Michael S. Louis – Beck (1995). Data analysis an introduction, Series: quantitative applications in the social sciences. Sage. Publications. London.

BCA Semester - I

Subject: Computer Applications

SKILL ENHANCEMENT COURSE (SEC)-I

Title of Paper: FUNDAMENTALS OF DIGITAL LOGIC

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Mode of Examination	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
SEC-I	Theory + Practical	02	03hrs	30	Practical	2hr	25	25	50

Course Outcome (CO):

After completion of Skill Enhancement course, students will be able to:

CO 1 : To teach the basics involved in data representation and digital logic circuit.

CO 2 : It includes the general concept in digital logic design.

CO 3 : To make better understanding of logic used in combinational circuit design.

Syllabus- SEC-1: Title-FUNDAMENTALS OF DIGITAL LOGIC	30 Hrs
Unit –1	10
Number Representation: Positional representation of numbers, decimal, binary, octal, Hexadecimal number systems, general radix system, numbers, conversions, complements, binary codes, Fixed point representation, floating point representation, representation for numeric data , arithmetic with signed unsigned numbers, addition, subtraction. Introduction to array correction and array detection. Introduction to logic circuits-variables and functions, truth tables, logic gates and networks, Boolean algebra, synthesis using AND, OR and NOT gates, NAND and NOR logic networks.	
Unit – 2	10
Optimized implementation of logic functions-karnaugh map, strategy for minimization, minimization of product of sums forms, incompletely specified functions, multiple output circuits, multilevel synthesis, a tabular method for minimization, cubical technique for minimization, practical considerations.	
Unit – 3	10
Combinational logic- design procedures, adders, subtractors, design of arithmetic circuits, multiplexers, demultiplexers, encoders, decoders, code converters, verilog for combinational circuits.	

List of the Experiments for 52 hrs / Semesters

1. Introduction to digital Electronics lab (Simulators)

i. Nomenclature of digital I/C's, Specifications

ii. Tools required-Simulators

Gates:

2. AND

3. NOT

4. OR

5. NAND

6. NOR

7. XOR

Implement of given Boolean function using logic gates

8. SOP: $A.B+A.B$

9. POS: $(A+B) (B+C) (A+C)$

Draw the logic circuit diagram & truth table, test the output in the simulator

General instructions:

Scheme of Practical Examination (distribution of marks): 25 marks for Semester end examination

1. 7 Marks (Program 1 + Execution without error)

2. 7 Marks (Program 2 + Execution without error)

3. Viva 6 Marks

4. Journal 5 Marks

Total 25 marks

Note: Same Scheme may be used for IA(Formative Assessment) examination

Books recommended.

Text Books

1. Fundamental of digital logic with Verilog Design by Stephen Brown & ZVONKO VRANESIC, Tata McGrawHill.

2. Digital Design by M. Morris Mano, Pearson.

References

1. Computer System Architecture, M. Morris Mano, Third edition, Pearson Education.

2. Computer Organization and Architecture, W. Stallings, Pearson Education.

Details of Formative assessment (IA) for DSCC theory/OEC: 40% weight age for total marks

Type of Assessment	Weight age	Duration	Commencement
Written test-1	10%	1 hr	8 th Week
Written test-2	10%	1 hr	12 th Week
Seminar	10%	10 minutes	--
Case study / Assignment / Field work / Project work/ Activity	10%	-----	--
Total	40% of the maximum marks allotted for the paper		

**Faculty of Science
04 - Year UG Honors programme:2021-22**

**GENERAL PATTERN OF THEORY QUESTION PAPER FOR DSCC/ OEC
(60 marks for semester end Examination with 2 hrs duration)**

Part-A

1. Question number 1-06 carries 2 marks each. Answer any 05 questions : 10marks

Part-B

2. Question number 07- 11 carries 05Marks each. Answer any 04 questions : 20 marks

Part-C

3. Question number 12-15 carries 10 Marks each. Answer any 03 questions : 30 marks

(Minimum 1 question from each unit and 10 marks question may have sub questions for 7+3 or 6+4 or 5+5 if necessary)

Total: 60 Marks

Note: Proportionate weight age shall be given to each unit based on number of hours prescribed.



BCA Semester – II

**Subject: Computer Applications
Discipline Specific Course (DSC)**

The course DSCC 3 in II semester has two papers (Theory Paper –I for 04 credits & Practical paper-II for 2 credits) for 06 credits: Both the papers are compulsory. Details of the courses are as under.

Course No.3 (Theory): Title of the Course (Theory) : DATA STRUCTURES

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course-03	DSCC	Theory	04	04	56 hrs	2hrs	40	60	100

Course Outcome (CO):

After completion of course (Theory), students will be able to:

- CO 1** : To impart the basic concepts of data structures and algorithms.
- CO 2** : To familiar with data structural algorithms such as sorting & searching, stack & queue, linked list and trees.
- CO 3** : To be familiar with some graph algorithms such as binary tree representation of tree and operations on trees.
- CO 4** : To understand the basic concepts of tree traversal.
- CO 5** : How to use basic data structure for program implementation.

Syllabus- Course 2(Theory): DATA STRUCTURES	Total Hrs: 56
Unit-I	14 hrs
Introduction to Data Structure: Structure Definition, Initialisation, Array as structure, Array within structure, Union. Understanding pointers, Declaring and initializing pointers, accessing a variable through its pointer, static and dynamic memory allocation. Definition of Data Structure, Classification of Data Structure: Primitive and Non-Primitive, Operations on Data Structure, Review of Array.	
Unit-II	14 hrs
Searching and Sorting: Searching Definition, Searching Techniques: Sequential search, Binary search. Comparison Between sequential and binary searching. Sorting Definition, Sorting Techniques: Bubble sort, Merge sort, Selection sort, Quick sort, Insertion Sort.	
Unit-III	14 hrs
Stack and Queue: Definition of stack, Array Representation of Stack, Linked List Representation of stack, Operation Performed on Stack, Infix, Prefix, Postfix notations, Conversion of arithmetic expressions, Application of stack. Definition of Queue, Array Representation of Queue, Types of Queue: Simple queue, Circular queue, Double ended queue, Priority queue, Operations on all types of queue.	

Unit-IV	14 hrs
<p>Linked List: Definition, Representation of linked lists in Memory, Types of linked list: Singly linked list, Doubly linked list and Circular linked list. Operations on linked list: Creation, Insertion, Deletion, Search, Display and Traversing. Advantages and disadvantages of linked list.</p> <p>Trees: Definitions, Tree terminology, Binary tree, Complete binary tree. Operations on Binary Trees, Representation of binary tree.</p>	

Books recommended.

Text Books

1. Kamthane: Introduction to Data Structure in C. Pearson education 2005.
2. Fundamentals of Data structures in C, 2nd Edition, E.Horowitz, S.Sahni and Susan Anderson-Freed, Universities Press.

References

1. Data Structures using C, A.M.Tanenbaum, Y. Langsam, M.J.Augenstein, Pearson.
2. Data structures and Program Design in C, 2nd edition, R.Kruse, C.L.Tondo and B.Leung, Pearson.
3. Data structures A Programming Approach with C, D.S.Kushwaha and A.K.Misra, PHI.
4. E. Balaguruswamy, Programming in ANSI C, Tata Mc Graw-Hill.

BCA Semester – II

Subject: Computer Applications
Discipline Specific Course (DSC)

Course No.3 (Practical): Title of the Course (Practical) : **Data Structure Lab**

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course-03	DSCC	Practical	02	04	52 hrs	3hrs	25	25	50

Course Outcome (CO):

After completion of course (Practical), students will be able to:

CO 1 : Be able to design & implement list data structure using

- i. **Stack & Queue**
- ii. **Linked list**
- iii. **Singly & doubly linked list**

CO 2 : Design & implement searching and sorting by applying various operations.

CO 3 : Design & implement basic operation on trees.

List of the Experiments for 52 hrs / Semesters

1. Write a Program to create, Initialize and access a pointer variable.
2. Write a Program to Calculate the length of the string using a pointer.
3. Write a Program to swap numbers using pointer.
4. Write a program in C to print all permutations of a given string using pointers.
5. Write a Program to store n students information using structure.
6. Write Program to implement Push, Pop and Traverse operation on STACK.
7. Write Program to convert infix notation to postfix notation.
8. Write Program to convert Infix notation to prefix notation.
9. Write a program to convert Prefix notation to postfix notation.
10. Write Program to perform the operation Insert, Delete and Display on Queue.
11. Write Program to implement Circular queue.
12. Write Program to implement Double ended queue.
13. Write Program to implement Priority queue.
14. Write a Program to search an element using Linear search.
15. Write a Program to sort given Array using Insertion sort technique.
16. Write a Program to sort given Array using Bubble sort technique.
17. Write a Program to sort given Array using Quick sort technique.
18. Write a Program to sort given Array using selection sort technique.
19. Write Program to implement Singly Linked List.
20. Write Program to implement Double Linked List.

General instructions:

Implement all the programs using C Language

Scheme of Practical Examination (distribution of marks): 25 marks for Semester end examination

- 1. 7 Marks (Program 1 + Execution without error)**
- 2. 7 Marks (Program 2 + Execution without error)**
- 3. Viva 6 Marks**
- 4. Journal 5 Marks**

Total 25 marks

Note: Same Scheme may be used for IA(Formative Assessment) examination

BCA Semester – II

**Subject: Computer Applications
Discipline Specific Course (DSC)**

The course DSCC 4 in II semester has two papers (Theory Paper –I for 04 credits & Practical paper-II for 2 credits) for 06 credits: Both the papers are compulsory. Details of the courses are as under.

Course No.4 (Theory): Title of the Course (Theory) : DISCRETE MATHEMATICAL STRUCTURE

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course-04	DSCC	Theory	04	04	56 hrs	2hrs	40	60	100

Course Outcome (CO):

After completion of course (Theory), students will be able to:

- CO 1** : Define basic concepts of preposition logic and proofs.
- CO 2** : Define sets, sequences, sum and summation.
- CO 3** : Solve problems using counting techniques.
- CO 4** : Solve problems using advance counting technique.
- CO 5** : Introduction to induction & recursion and writing algorithms using recursion.
- CO 6** : Studying the properties of relations.
- CO 7** : Describe the origin of graph theory, illustrate different types of graphs.
- CO 8** : Categorize trees.

Syllabus- Course 2(Theory): DISCRETE MATHEMATICAL STRUCTURE	Total Hrs: 56
Unit-I	14 hrs
The Foundations: Logic and proofs: Propositional Logic, Applications of Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Proof Methods and Strategy. Basic Structures: Sets, Functions, Sequences, Sums, and Matrices: Sets, Set operations, Functions, Sequences and Summations, matrices.	
Unit-II	14 hrs
Counting: Basics of counting, Pigeonhole principle, Permutation and Combination, Binomial Coefficient and Combinations, Generating Permutation and Combination. Advanced Counting Techniques: Applications of Recurrence Relations, Solving Linear Recurrence, Relations, Divide and Conquer Algorithms and Recurrence Relations, Generating functions , Inclusion-Exclusion , Applications of Inclusion-exclusion.	

Unit-III	14 hrs
<p>Induction and Recursion: Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Recursive Algorithms, Program Corrections.</p> <p>Relation: Properties of relation, Composition of relation, Closer operation on relation, Equivalence relation and partition. Operation on relation, Representing relation.</p>	
Unit-IV	14 hrs
<p>Graphs: Graphs and Graph models, Graph Terminology and Special Types of Graphs, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamilton Paths , Shortest-Path Problems, Planar Graphs, Graph Coloring.</p> <p>Trees: Introduction to Trees , Applications of Trees, Tree traversal , Spinning Trees, Minimum Spanning Trees.</p>	

Books recommended.

Text Books

1. Discrete Mathematics and Its Applications, Kenneth H. Rosen: Seventh Edition, 2012.

References

1. Discrete Mathematical Structure , Bernard Kolman, Robert C , Busby, Sharon Ross, 2003.
2. Graph Theory with Applications to Engg and Comp. Sci: Narsingh Deo-PHI 1986.
3. Discrete and Combinatorial Mathematics Ralph P. Grimaldi, B. V . Ramatta, Pearson, Education , 5 Edition.
4. Discrete Mathematical Structures, Trembley and Manobar.

BCA Semester – II

Subject: Computer Applications
Discipline Specific Course (DSC)

Course No.4 (Practical): Title of the Course (Practical) : **DMS Lab**

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course-04	DSCC	Practical	02	04	52 hrs	3hrs	25	25	50

Course Outcome (CO):

After completion of course (Practical), students will be able to:

CO 1 : Design & implement quantification & arithmetic series.

CO 2 : Design & implement of sets by applying various operations.

CO 3 : Implement the recursion operation on Factorial, Fibonacci series, tower of Honai, Binary search & Merge sort.

List of the Experiments for 52 hrs / Semesters

1. Write program to implement universal quantification.
2. Write a program to find sum of arithmetic series.
3. Write a program to find sum of the first 10 terms of the sequence $1/n^2$.
4. Write a Program to find intersection of two sets.
5. Write a Program to find power set of a given set.
6. Write a Program to find Factorial of a number using recursion.
7. Write a Program to find Fibonacci series using recursion.
8. Write a Program to solve Tower of Hanoi problem using recursion.
9. Write a Program to search an element using Binary search technique.
10. Write a Program to sort given Array using Merge sort technique.
11. Write a Program to find the minimum and maximum number in a set of N number using Divide and Conquer method.
12. Write a Program to solve Travelling sales man problem.
13. Write a Program to find the shorted path from the specific vertex to all other vertices(Single Source shorted path)
14. Write Program to Create Binary tree.
15. Write Program to implement In-order, Pre-order and Post- order Traversing on Tree.

General instructions:

Implement all the programs using C Language

Scheme of Practical Examination (distribution of marks): 25 marks for Semester end examination

- 1. 7 Marks (Program 1 + Execution without error)**
- 2. 7 Marks (Program 2 + Execution without error)**
- 3. Viva 6 Marks**
- 4. Journal 5 Marks**

Total 25 marks

Note: Same Scheme may be used for IA(Formative Assessment) examination

BCA Semester – II

Subject: Computer Applications Open Elective Course (OEC-2)

(OEC for other Degree students and the students of BCA where exclusive BCA Programme working as single faculty)

OEC-2: Title of the Course : INTRODUCTION TO FINANCIAL ACCOUNTING USING TALLY

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
OEC-2	OEC	Theory	03	03	42 hrs	2hrs	40	60	100

Course Outcome (CO):

After completion of course, students will be able to:

- CO 1** : To develop accounting ability of students.
- CO 2** : To teach the basics involved in creating book of account, ledgers, voucher system.
- CO 3** : To make better understanding of bank reconciliation statement and trail balance.
- CO 4** : To explore the basics of stock groups.
- CO 5** : To study the preparation of final accounts of trading, loss account and balance sheet.
- CO 6** : To make the better understanding of provisions of companies act.

Syllabus- OEC: Introduction to Financial Accounting using Tally	Total Hrs: 42
Unit-I	14 hrs
Introduction: Financial Accounting-definition and Scope, objectives of Financial Accounting, Accounting v/s Book Keeping Terms used in accounting, Users of accounting information and limitations of Financial Accounting. Accounting Concepts, Types of Accounts, Accounting Principles or concepts, mode of Accounting, Rules of Accounting, Double entry system of book keeping. Conceptual Frame work, Accounting Standards in India-concept, objectives, benefits Accounting Policies, Accounting as a measurement discipline, valuation Principles, accounting estimates.	
Unit-II	14 hrs
Recording of transactions Company Creation, Alter, Backup & Restore, Creating book of account, Group, subsidiary Group, Ledgers Voucher system; Accounting Process, Journals, Subsidiary Books, Ledger, Cash Book, Bank Reconciliation Statement, Trial Balance. Depreciation: Meaning, need & importance of depreciation, methods of charging depreciation.(WDV & SLM) Stock Groups : Multiple Stock Groups , Stock Categories , Multiple Stock Categories , Units of Measure, Godowns, Stock Items.	

Unit-III	14 hrs
Preparation of final accounts Preparation of Trading and Profit & Loss Account and Balance Sheet of sole proprietary business Introduction to Company Final Accounts: Important provisions of Companies Act, 1956 in respect of preparation of Final Accounts. Understanding of final accounts of a Company.	

Books recommended.

Text Books

1. Fundamentals of Accounting & Financial Analysis: By Anil Chowdhry (Pearson Education)
2. Mastering Tally ERP 9: Basic Accounts, Invoice, Inventory by Asok K. Nadhani(BPB Publication)

References

1. Financial accounting: By Jane Reimers (Pearson Education)
2. Accounting Made Easy By Rajesh Agarwal & R Srinivasan (Tata McGraw –Hill)

Details of Formative assessment (IA) for DSCC theory/OEC: 40% weight age for total marks

Type of Assessment	Weight age	Duration	Commencement
Written test-1	10%	1 hr	8 th Week
Written test-2	10%	1 hr	12 th Week
Seminar	10%	10 minutes	--
Case study / Assignment / Field work / Project work/ Activity	10%	-----	--
Total	40% of the maximum marks allotted for the paper		

**Faculty of Science
04 - Year UG Honors programme:2021-22**

**GENERAL PATTERN OF THEORY QUESTION PAPER FOR DSCC/ OEC
(60 marks for semester end Examination with 2 hrs duration)**

Part-A

1. Question number 1-06 carries 2 marks each. Answer any 05 questions : 10marks

Part-B

2. Question number 07- 11 carries 05Marks each. Answer any 04 questions : 20 marks

Part-C

3. Question number 12-15 carries 10 Marks each. Answer any 03 questions : 30 marks

(Minimum 1 question from each unit and 10 marks question may have sub questions for 7+3 or 6+4 or 5+5 if necessary)

Total: 60 Marks

Note: Proportionate weight age shall be given to each unit based on number of hours prescribed.

