CURRICULUM AND CREDIT FRAMEWORK FOR BACHELOR OF COMPUTER APPLICATIONS AS PER NATIONAL EDUCATION POLICY 2020

FACULTY OF SCIENCE
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CREDIT FRAMEWORK FOR 3/4 YEARS UG PROGRAMME (HONOURS) & (HONOURS WITH RESEARCH)

Course Category		Major Courses			Minor Courses			Multidisciplinary Courses			Ability Enhancement Courses			Skill Enhancement Courses/ Internship			Value Added Courses			RP / OJT	Total Credits	Qualification
		DSC			DSE			MDC			AEC			SEC			VAC					
Level	Sem	Course	Credit	Total	Course	Credit	Total	Course	Credit	Total	Course	Credit	Total	Course	Credit	Total	Course	Credit	Total	Credit		
4.5	1	2	4	8	1	4	4	1	4	4	1	2	2	1	2	2	1 (IKS)	2	2	-	22	UG Certificate
	2	2	4	8	1	4	4	1	4	4	1	2	2	1	2	2	1(VAC)	2	2	-	22	
TOTAL		4		16	2		8	2		8	2		4	2		4	2		4		44	
Exit 1: Award of UG Certificate in Major with 44 Credits with additional 4 Credits Summer Internship in CORE NSQF Course or Continue with Major and Minor																						
5.0	3	3	4	12	-	-	-	1	4	4	1	2	2	1	2	2	1 (IKS)	2	2	-	22	UG Diploma
	4	3	4	12	1	4	4	-	-	-	1	2	2	1	2	2	1(VAC)	2	2	-	22	
TOTAL		10		40	3		12	3		12	4		8	4		8	4		8		88	
Exit 2: Award of UG Diploma in Major with 88 Credits with additional 4 Credits Summer Internship in CORE NSQF Course or Continue with Major and Minor																						
5.5	5	3	4	12	2	4	8	-	-	-	-	-	-	1	2	2	-	-	-	-	22	UG Degree
	6	3	4	12	1	4	4	-	-	-	1	2	2	1	4	4 (I)	-	-	-	-	22	
TOTAL		16		64	6		24	3		12	5		10	6		14	4		8		132	
Award of UG Degree in Major with 132 Credits with additional 4 Credits and Internship in same Discipline or Continue with Major and Minor																						
6.0	7	3	4	12	1	4	4	-	-	-	-	-	-	-	-	-	-	-	-	6 (OJT)	22	UG Honours Degree
	8	3	4	12	1	4	4	-	-	-	-	-	-	-	-	-	-	-	-	6 (OJT)	22	
TOTAL		22		88	8		32	3		12	5		10	6		14	4		8	12	176	
Award of UG Honours Degree in Major with 176 Credits																						
6.0	7	3	4	12	1	4	4	-	-	-	-	-	-	-	-	-	-	-	-	6 (RP)	22	UG Honours with Research
	8	3	4	12	1	4	4	-	-	-	-	-	-	-	-	-	-	-	-	6 (RP)	22	
TOTAL		22		88	8		32	3		12	5		10	6		14	4		8	12	176	
Award of UG Honours with Research Degree in Major with 176 Credits including 12 credits of Research Projects/Dissertation																						

SUMMARY OF CREDIT STRUCTURE FOR 3/4 YEARS UG DEGREE PROGRAMME

NCrF Credit Level	Qualification	Required Credits	No. of Semesters	Time (Years)
4.5	UG Certificate	44	2	1
5.0	UG Diploma	88	4	2
5.5	UG Degree	132	6	3
6.0	UG Honours Degree **OR** UG Honours With Research	176	8	4

MINIMUM CREDIT REQUIREMENTS TO AWARD DEGREE UNDER EACH CATEGORY

Sr. No.	Broad Category of Course	Minimum Credit Requirement			
		3 Years UG		4 Years UG	
		No. of Papers	Total Credits	No. of Papers	Total Credits
1	Major (Core) Courses (With Internship)	16 + 1	68	22 + 1	92
2	Minor (Elective) Courses	6	24	8	32
3	Multidisciplinary/Interdisciplinary / Allied Courses (MDC)	3	12	3	12
4	Ability Enhancement Courses (AEC)	5	10	5	10
5	Skilled Enhancement Courses (SEC)	5	10	5	10
6	Value Added Courses (VAC)	4	8	4	8
7	Research Dissertation	-	-	-	12
	TOTAL CREDITS		**132**		**176**
8	Vocational / Exit Courses		**04**		

COURSE & CREDIT STRUCTURE OF
BACHELOR OF COMPUTER APPLICATIONS

Level 4.5: B. C.A. Semester I & II (Certificate in Computer Applications)

Semester - I								
Sr. No	**Course Category**	**Course Title**	**Course Credits**			**Exam Marks**		
			Theory	**Practical**	**Total**	**IM**	**EM**	**Total**
1	Major 1	Programming Fundamentals Using C	3	1	4	50	50	100
2	Major 2	Web Designing Using HTML,CSS & JavaScript	3	1	4	50	50	100
3	Minor 1	MS-Office Tools(Word, PowerPoint and Excel)	3	1	4	50	50	100
4	MDC 1	Fundamental of Mathematics	4	0	4	50	50	100
5	AEC 1	General English	2	0	2	25	25	50
6	SEC 1	Computer Fundamental	2	0	2	25	25	50
7	VAC 1	Select any one 1. Indian Knowledge Systems 2. Professional Ethics & Value	2	0	2	25	25	50
		TOTAL CREDITS			**22**			
8	**Vocational / Exit Course/s**				**04**			

Semester - II								
Sr. No	**Course Category**	**Course Title**	**Course Credits**			**Exam Marks**		
			Theory	**Practical**	**Total**	**IM**	**EM**	**Total**
1	Major 3	Advanced C	3	1	4	50	50	100
2	Major 4	Web Designing using CSS, XML & JavaScript-II	3	1	4	50	50	100
3	Minor 2	Data Structures using C	3	1	4	50	50	100
4	MDC	Discrete Mathematics	4	0	4	50	50	100
5	AEC	Personality Development & Corporate Skills	2	0	2	25	25	50
6	SEC	Operating Systems-I	2	0	2	25	25	50
7	VAC	Select any one . Environment Studies(VAC3) . Business Incubation(VAC4)	2	0	2	25	25	50
		TOTAL CREDITS			**22**			
8	**Vocational / Exit Course/s**				**04**			

CURRICULUM

For

B.C.A.

Semester – 1

(With effective from June - 2023)

Level 4.5: B. C.A. Semester I & II (Certificate in Computer Applications)

SEMESTER – I				
Sr. No.	**Course Category**	**Course Title**	**Credits**	**Page No.**
1	Major 1	Programming Fundamentals Using C	4	7
2	Major 2	Web Designing Using HTML,CSS & JavaScript	4	9
3	Minor 1	MS-Office Tools(Word, PowerPoint and Excel)	4	12
4	MDC 1	Fundamental of Mathematics	4	14
5	AEC 1	General English	2	15
6	SEC 1	Computer Fundamental	2	16
7	VAC 1	Indian Knowledge Systems	2	17
		Professional Ethics & Value		19
		Total Credits	**22**	
8	**Vocational / Exit Courses**		**04**	21

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 1								
TITLE OF THE COURSE: PROGRAMMING FUNDAMENTAL USING C								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
1	BCA23MJ101	MAJOR 1	3+1 = 4	45	30	50	50	100

Course Content		
Unit	**Description**	**Lectures**
1.	**Basics of Programming-** Compiler, Interpreter, Linker, Loader, Algorithm, Flowchart, Testing and Execution. Examples of flow charts and algorithms **Programming Tokens:** Keywords, Identifiers, Constants, Variables, Data types, defining symbolic constants, Simple Programs.	9+6
2.	**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.	9+6
3.	**Input/output Functions:** Unformatted & formatted I/O functions. **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**.**	9+6
4.	**Arrays:** Definition, types, initialization, processing an array, passing arrays to functions, Array of Strings.	9+6
5.	**Strings**: String constant and variables, Declaration and initialization of string, Input/output of string data, String Handling Functions: strlen, strcat, strcmp, strcpy, strrev. **Functions**: Definition, types of user defined functions, prototype, Local and global variables, passing parameters, recursion.	9+6
	Total Lectures	**45+30**

Reference Books:

- E. Balagurusami: Prgramming in ANSI C., Eighth Edition, Tata McGraw Hill Publication, 2019.
- Kernighan B., Ritchie D.: The C Programming Language, Prentice Hall, 1988
- Cooper H. & Mullish H: The spirit of C, Jaico Publication House, New Delhi, 1988.

List of Sample Programs of C Language
1. WAP to enter two numbers and find sum
2. WAP to enter radius of a circle and find area of circle

3. WAP to enter base and height of a Triangle and find area of Triangle
4. WAP to enter three digit number and find sum of digit.
5. WAP to enter three digit number and find reverse of a number
6. WAP to enter two numbers and find Maximum number.
7. WAP to enter two numbers and find Minimum number.
8. WAP to enter number and find whether it is even or odd.
9. WAP to enter three numbers and find Maximum number.
10. WAP to enter number and find factorial of a number.
11. WAP to enter number and find whether it is prime number of not.
12. WAP to show below pattern: * ** *** **** *****
13. WAP to show below pattern: 1 12 123 1234 12345
14. WAP to enter number and check whether it is an Armstrong Number or not
15. WAP to 5 students marks and find number of students passed and fail depending on the marks.
16. WAP to enter 5 numbers and count how many numbers are even or odd using an array and display
17. WAP to enter 3 x 3 Matrices values and find the sum of all values.
18. WAP to enter 3 x 3 Matrices values and find sum of diagonal elements, upper triangle and lower triangle.
19. WAP to enter two 2 x 2 Matrices values and find multiplication of matrices
20. WAP to enter number and find the sum using No Return and No Passing Parameter using function.
21. WAP to enter number and find the sum using Return and No Passing Parameter using function.
22. WAP to enter number and find the sum using No Return and Passing Parameter using function.
23. WAP to enter number and find the sum using Return and Passing Parameter using function.
24. WAP to demonstrate call by value and call by reference.
25. WAP to find the addition and subtraction of two matrices using function
26. WAP to enter the string and find the length of a string without using library function.
27. WAP to enter the string and compare it without using library function.
28. WAP to enter the string and reverse it without using library function.
29. WAP to enter the string and convert lower letter to upper letters
30. WAP to enter the string and count the number of vowels, consonants and special characters in a given sequence.

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 1								
TITLE OF THE COURSE: WEB DESIGNING USING HTML, CSS & JAVASCRIPT								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
2	BCA23MJ102	MAJOR 2	3+1 = 4	45	30	50	50	100

Course Content		
Unit	**Description**	**Lectures**
1.	The Internet and Web Browsers Introduction to the Internet History of the Internet Services provided by the Internet Some basic terminology and concepts (WWW, URL, webpage, web site, web servers, web browsers, HTML, search engines, etc.)	9+6
2.	**Web Page Designing** An introduction to HTM, HTML tags Structure of an HTML document Text and paragraph formatting Ordered and unordered lists, nested lists, HTML tables Hyperlinks Images Frames, framesets, nested framesets, Designing HTML forms.	9+6
3.	**Basics of JavaScript** Font, color, background, text, border, margin and list related attributes. Use of classes, spans, divs. Working with layers Introduction to JavaScript. Applications and advantages of JavaScript. Using JavaScript on a webpage.	9+6
4	Introduction to DHTML & Cascading Style Sheets What is DHTML? Applications of DHTML Components of DHTML Scripting : introduction, client-side v/s server-side Introduction to Cascading Style Sheets (CSS) Ways of specifying style – inline, internal, external.	9+6
5	**Advanced JavaScript** JavaScript basics – syntax, data types and literals, type casting, variables, operators, arrays. Flow control statements. Built-in functions Working with strings, numbers, dates & times, etc. User interaction through dialog boxes. User-defined functions.	9+6
	Total	**45+30**

Reference Books:

- Ivan Bayross, Web Enabled Commercial Applications Development using HTML, DHTML, JavaScript, Perl CGI, BPB, 2004
- Thomas A. Powell, HTML & CSS: The Complete Reference, Fifth Edition, Tata McGraw-Hill,2010
- Jeremy Keith, HTML5 for Web Designers, A BOOK APART, 2010.
- Xavier C: World Wide Web Design with HTML, Tata McGraw Hill Publication, 2000

List of Sample Programs of HTML, CSS and JavaScript

1. Write HTML code display all Heading Tag
2. Write HTML code to produce the following output:
   SGGU
   SGGU
   SGGU
   M.R.P : ~~1000~~
3. Write HTML code to produce the following output:
   $X^2 + Y^2 + Z = 0$
   $X_2+Y_2+Z=0$
4. Write HTML code to produce the following output without using table:

Sr. No	First Name	Last Name
1	A	B
2	C	D
3	E	F

5. Write HTML code to display your personal information such as a name, address, phone numbers and date of birth.
6. Write HTML code to create Birthday Invitation. Make use of color attributes.
7. Write HTML code to produce following output:
   1. A
   2. B
   3. C
8. Write HTML code to produce following output:
   - **Arts**
     1. Marathi
     2. Hindi
     3. English
   - **Commerce**
     1. Accounting
     2. Costing
     3. Auditing
   - **Science**
     1. Physics
     2. Chemistry
     3. Biology
9. Write HTML code which links between two pages.
10. Write HTML code for creating link to specific location within document.
11. Write HTML code for display Image in webpage.
12. Write HTML code for displaying following table:

Temperature	High	Low
A	19	11
B	20	19
C	45	32
D	67	56
E	89	76

13. Write HTML code for displaying following table:

Item Name	With	Price
PavBhaji	Butter	100
	Cheese	120
Noodles		200
Rice	-	100
Dal	-	100

14. Write HTML code for designing a Sign Up(Registration) Form
15. Write HTML code for designing a Sign In(Login) Form

16. Write an HTML code to create a Textarea of 20 columns and 20 rows in a form and include the message “Shri Govind Guru University” in that textarea.
17. Write HTML code to display Heading in different colors using CSS
18. Write HTML code to create a frameset with top and left side frame
19. Create a JavaScript code to display any message.
20. Create a JavaScript code using Arithmetic Operator, Assignment Operator, Comparison Operator, Logical Operator and String Operator.
21. Create a JavaScript code using Control Statement
22. Create a JavaScript code to display 5*1=5 5*2=10 5*10=50 using for loop.
23. Create a JavaScript code using User Defined Function which will calculate the area of circle.
24. Write a JavaScript code to add items to a blank array and compute the sum of integers and display them.
25. Create a JavaScript code to set paragraph background color.

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 1								
TITLE OF THE COURSE: MS-OFFICE TOOLS								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
3	BCA23MN101	MINOR 1	3+1 = 4	45	30	50	50	100

Course Content		
Unit	**Description**	**Lectures**
1.	**MS Windows**: Introduction to M.S. Windows; Features of Windows; Various versions of Windows & its use; Working with Windows; My Computer & Recycle bin ; Desktop, Icons and Windows Explorer; Screen description & working styles of Windows; Dialog Boxes & Toolbars; Working with Files & Folders; simple operations like copy, delete,moving of files and folders from one drive to another, Shortcuts & Autostarts; Accessories and Windows Settings using Control Panel- setting common devices using control panel, modem, printers, audio, network, fonts, creating users, internet settings, Start button & Program lists; Installing and Uninstalling new Hardware & Software program on your computer.	9+6
2.	**MS Word**: Introduction to MS Office; Introduction to MSWord; Features & area of use. Working with MS Word.; Menus & Commands; Toolbars & Buttons; Shortcut Menus, Wizards & Templates; Creating a New Document; Different Page Views and layouts; Applying various Text Enhancements;	9+6
3.	**MS Word**: Working with – Styles, Text Attributes; Paragraph and Page Formatting; Text Editing using various features ; Bullets, Numbering, Auto formatting, Printing & various print options, Spell Check, Thesaurus, Find & Replace; Headers & Footers ; Inserting – Page Numbers, Pictures, Files, Autotexts, Symbols etc.; Working with Columns, Tabs & Indents; Creation & Working with Tables including conversion to and from text; Margins & Space management in Document; Adding References and Graphics;, Envelops & Mailing Labels.	9+6
4.	**MS Excel**: Introduction and area of use; Working with MS Excel.; concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations & Functions; Cell Formatting including Borders & Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with various options.	9+6
5.	**MS PowerPoint**: Introduction & area of use; Working with MS PowerPoint; Creating a New Presentation; Working with Presentation; Using Wizards; Slides& its different views; Inserting, Deleting and Copying of Slides; Working with Notes, Handouts, Columns & Lists; Adding Graphics, Sounds and Movies to a Slide; Working with PowerPoint Objects; Designing & Presentation of a Slide Show; Printing Presentations, Notes.	9+6
	Total	**45+30**

Reference Books:

- Windows XP Complete Reference. BPB Publications
- Joe Habraken, Microsoft Office 2000, 8 in 1 by, Prentice Hall of India
- I.T. Tools and Applications by A. Mansoor, Pragya Publications, Matura

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 1								
TITLE OF THE COURSE: FUNDAMENTAL OF MATHEMATICS								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
4	BCA23MD101	MDC 1	4	60	NIL	50	50	100

Course Content		
Unit	**Description**	**Lectures**
1.	**Determinants**: Definition, Minors, Cofactors MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scala Multiplication and Multiplication of Matrices, Adjoint, Inverse, Rank of Matrix	12
2.	**Differential Calculus**: Definition, rules for differentiating functions (addition, subtraction, product and quotient), derivative of an algebraic function, exponential function & logarithmic function, composite functions – the chain rule, higher derivatives, business applications	12
3.	**Sequence and Series** Introduction to Sequence and Series, Representation of Sequence and Series, Progression: Arithmetic Progression(A.P.), Common difference, nth term of an A.P., The sum of first n terms of an A.P., Geometric Progression(G.P.), Common Ratio, nth term of a G.P., The sum of first n terms of a G.P., Harmonic Progression(H.P.)	12
4.	**Statistics:** Introduction to statistics, definitions, origin and growth, function of statistics, managerial applications, scope of statistics, misuse and limitations of statistics	12
5.	**Measures of Central Tendency**: properties, arithmetic mean, geometric mean, harmonic mean, median, mode, quartiles, deciles and percentiles, merits and demerits of each of these measures of central tendency.	12
	Total	**60**

Reference Books:

1. Business mathematics by Sancheti and Kapoor
2. Business mathematics by B S Shah Prakashan
3. Gupta S.P. and Kapoor, V.K., Fundamentals of Mathematical statistics, Sultan Chand and Sons.
4. B.S. Grewal, “Elementary Engineering Mathematics”, 34th Ed., 1998.

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 1								
TITLE OF THE COURSE: GENERAL ENGLISH								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
5	BCA23AE101	AEC 1	2	30	NIL	25	25	50

Course Content		
Unit	**Description**	**Lectures**
1.	**Introduction to Communication:** Definition, meaning and significance of communication, Process of communication, its nature and its need. Introduction to different forms of Communication. **Writing Skills:** 1. Letters of Enquiry, Replies to Enquiry; Quotation and Voluntary offers; Placing of Orders, Execution of Order, Cancellation of Order;	10
2.	**Vocabulary and Grammar:** Synonyms and Antonyms; One word substitution; Usage of Noun, Pronoun, Articles, Prepositions, Conjunctions, Tenses, Modal Auxiliaries, Types of Sentences, Parts Of Speech	10
3.	**Oral Communication:** Meaning, nature and scope - Principles of effective oral communication - Techniques of effective speech. The art of listening - Principles of good listening	10
	Total	**30**

Reference Books:

1. Student Learner‟s Dictionary (Oxford)
2. English Grammar and Composition by Wren and Martin
3. Business communications by Neeru Vashishth, Namita Rajput

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 1								
TITLE OF THE COURSE: COMPUTER FUNDAMENTAL								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
6	BCA23SE101	SEC 1	2	30	NIL	25	25	50

Unit	Description	Lectures
1.	**Fundamentals of Computer** Evolution of Computers, Block diagram of computers, Types of Computers, Software, Types of Software, Hardware, commonly used Hardware, Operating Systems, Types of OS, Anatomy of the CPU – RAM, ROM, processor.	10
2.	**Number Systems** (Binary, Octal, Decimal, Hexa Decimal), Binary Arithmetic, 1‟s Complement, 2‟s Complement, ASCII, EBCDIC, UNICODE, GRAY CODE.	10
3.	**Computer Languages** Low level and high level languages, assemblers, compilers, interpreters, linkers, algorithms, flow chart: symbols and flow chart development of problem solution.	10
	Total	**30**

Reference Books:

1. Rajaraman V, Computer Fundamental , Pentice-Hall of India Pvt. Ltd(4ht Edition), 2003
2. P.K.Sinha , Computer Fundamental, 6th Edition,2003.

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 1								
TITLE OF THE COURSE: INDIAN KNOWLEDGE SYSTEMS								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
7	BCA23VA101	VAC 1	2	30	NIL	25	25	50

Course Objective:

- The objective of the course is to set a stage for understanding the architecture of the Ancient Indian Knowledge Systems and to develop an overall understanding of their role and relevance to the contemporary society

Learning Outcomes:

After completion of the course, learners will be able to:

1. Identify the concept of Traditional knowledge and its importance;
2. Explain the need for and importance of protecting traditional knowledge;
3. Explain the importance of Traditional knowledge in Agriculture and Medicine;
4. Know history of Indian economy thoughts and Kautiya's Economic thoughts;
5. Interpret the concepts of concept of Indian business model.

Course Content		
Unit	**Description**	**Lectures**
1.	**Introduction to Indian Knowledge Systems** Introduction, Definition, Concept of Indian Knowledge Systems (IKS), A board overview of disciplines included in the IKS, and historical developments, Scope of IKS, IKS based approached on Knowledge Paradigms, IKS in ancient India and in Modern India.	10
2.	**IKS and Indian Scholars, Indian Literature** Introduction, Philosophy and Literature [Maharishi Vyas, Manu, Kanad, Pingala, Parasar, Banabhatta, Nagarjuna,and Panini], Mathematics and Astronomy (Arybhatta Mahavicharya, Bodhyan, Bhashkaracharya, Varahamira and Brahmgupta),	10
3.	**Indian Economy Thoughts and Model** History of Indian Economy Thoughts: Contexts from Dharmashastras, Shukarntiti, Mahabharata, and Arthshastra; Kautiya's Economic thoughts in specific India and Global GDP: Ancient India.	10
	Total	**30**

Suggested Readings:

1. An Introduction to Indian Knowledge Systems: Concepts and Applications, B Mahadevan, V R Bhat, and Nagendra Pavana R N; 2022 (Prentice Hall of India).
2. Indian Knowledge Systems: Vol I and II, Kapil Kapoor and A K Singh; 2005 (D.K. Print World Ltd).
3. Kanagasabapathi; "Indian Models of Economy, Business and Management", Third Edition,
4. Prentice Hall India Ltd., Delhi.
5. Lotus and Stones; Garuda Prakashan (31 October 2020); Garuda Prakashan Pvt. Ltd.
6. Dwivedi D.N., Essentials of Business Economics, Vikas Publications, Latest Edition.

7. Inida Uninc by Prof. R Vaidyanathan, Westland ltd.Publication
8. Economic Sutras by Prof. Satish Y. Deodhar, IIMA Books series
9. Black Money Tax Heaven by R Vaidyanathan, Westland ltd. Publication

Note: Learners are advised to use latest edition of books

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 1								
TITLE OF THE COURSE: PROFESSIONAL ETHICS AND VALUES								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
7	BCA23VA102	VAC 1	2	30	NIL	25	25	50

Course Objectives:

- The course aims to develop in learners an understanding of the concept of Business Ethics & Human Values and its application in business decision making using sustainable business practices

Learning Outcomes:

After completion of the course, learners will be able to:

1. Design Code of Ethics for an organisation.
2. Discuss Ethical Performance of an organisation.
3. Describe and distinguish between various types of values.

Course Content		
Unit	**Description**	**Lectures**
1.	**Introduction** Introduction, Meaning & Definition of Ethics, Nature of Ethics, Scope of Ethics, Personal Ethics and Business Ethics, Morality and Law, How are Moral Standard formed? Religion and Morality, Morality, Approaches and Practices of Business Ethics, Ethical Decision Making and Decision- Making Process, Ethical Behavior of Manager. Ethical theories: Normative and descriptive ethical theories.	10
2.	**Business Ethics Management** Management Process and ethics, Ethos of Vedanta in Management, Hierarchism as an organizational value, Business Ethics & Cultural Ethos; role of various agencies in ensuring ethics in corporation; setting standards of ethical behavior; Managing stakeholder relations; Assessing ethical performance; Organizing for Business Ethics Management.	10
3.	**Human Values and Business** Meaning of Human Values; Formation of values: Socialization; types of Values: Society Values, Aesthetic Values, Organization Values, Spiritual Values; Value Crisis in Management; Concept of knowledge management and wisdom management, wisdom-based management. Concept of Karma and its kinds: Karma Yoga, Nishkam Karma, and Sakam Karma.	10
	Total	**30**

Suggested Readings:

1. Banerjee, S. B. (2007). Corporate Social Responsibility: The Good, The Bad and The Ugly. Cheltenham: Edward Elgar Publishing.
2. Kumar, S. (2010). Corporate Governance. Oxford, England: Oxford University Press.
3. Monks, R. A. G., & Minow, N. (2011). Corporate Governance, New Jersey: John Wiley and
4. Sons. Sherlekar, S. A. (2009). Ethics in Management. New Delhi: Himalaya Publishing House.
5. Vveinhardt, J., & Gulbovaite, E. (2015). Expert evaluation of diagnostic instrument for personal and organizational value congruence. Journal of Business Ethics, 136(3), 481–501.
6. Werther, W. B., & Chandler, D. B. (2011). Strategic corporate social responsibility. California: Sage Publications Inc.

Note: Learners are advised to use latest edition of text/reference books

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 1	
8	Vocational/Exit Courses

VOCATIONAL EDUCATION AND TRAINING: Vocational Education and Training will form an integral part of the undergraduate programme to impart skills along with theory and practical. Students can do one vocational course of 4 credits as a part of exit course.

Students can earn extra credits through vocational courses from SWAYAM (https://swayam.gov.in).

SWAYAM is a programme initiated by Government of India and designed to achieve the three cardinal principles of Education Policy viz., access, equity and quality. The objective of this effort is to take the best teaching learning resources to all, including the most disadvantaged. SWAYAM seeks to bridge the digital divide for students who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy.

CURRICULUM

For

B.C.A.

Semester – 2

(With effective from Nov./Dec - 2023)

Level 4.5: B. C.A. Semester I & II (Certificate in Computer Applications)

SEMESTER – II				
Sr. No.	**Course Category**	**Course Title**	**Credits**	**Page No.**
1	Major 3	Advanced C	4	24
2	Major 4	Web Designing using CSS, XML & JavaScript-II	4	27
3	Minor 2	Data Structures using C	4	29
4	MDC	Discrete Mathematics	4	31
5	AEC	Personality Development & Corporate Skills	2	32
6	SEC	Operating Systems-I	2	33
7	VAC 1	Environment Studies	2	34
		Business Incubation		36
		Total Credits	**22**	
8	**Vocational / Exit Courses**		**04**	37

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 2								
TITLE OF THE COURSE: ADVANCED C								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
1		MAJOR 3	3+1 = 4	45	30	50	50	100

Course Content		
Unit	**Description**	**Lectures**
1.	**User-Defined Functions** – Introduction and need of user defined Functions – Components of user defined functions – Methods of passing parameters to functions – Recursion	9+6
2.	**Dynamic Memory Functions** – Introduction – malloc() – calloc() – realloc() – free()	9+6
3.	**Structures, Unions and Command Line Arguments** – Introduction to structures – Structures and arrays – Structures within structures – Structures and functions – Unions	9+6
4.	**Usage of Pointers** – Introduction, usage and understanding of pointers – Declaration and initialization of pointer variables – Accessing variables through Pointers – Chain of Pointers (Pointer to Pointer) – Pointer arithmetic expression – Pointers and arrays – Pointers as function arguments – Pointer and structure	9+6
5.	**Usage of File Handling** – Introduction to File Handling – File Access Modes – Input Output Operations on files – Error Handling during I/O operations	9+6
	Total Lectures	**45+30**

Reference Books:

1. E. Balagurusamy – Programming in ANSI C, 3rd Edn. , TMH, New Delhi ; 2004
2. Programming with C, B.S.Gottfried (TMH)
3. Y. Kanetkar – Let us C, 4th Edition, BPB Publication , New Delhi; 2002

PRACTICAL:

Sr. No.	Program Definition
1.	Write a program to calculate average temperature of five days. create temp() function.
2.	Write a program that uses recursive function fibo() that generates a Fibonacci seriescontaining N elements.
3.	Write a program that uses recursive function fact() that finds the factorial of a given number N.
4.	Program to find if the given no. is prime or not. The function should accept the numberas argument and return if the no. is prime or not.
5.	Write a function which accepts a character array as argument from the user. The function should print the ASCII equivalent of all the characters in the string.
6.	Write a function which accepts a character array as argument from the user. Thefunction should convert all the lowercase characters into uppercase case.
7.	Write a user-defined function to perform a) Square of a number b) Area of a square c) Reverse the number
8.	Write a program that uses a function to check whether an entered three digit number ispalindrome or not.
9.	Write a program to create a list of books details. The details of a book include title,author, publisher, publishing year, number of pages, and price.
10.	Define a structure called Item with members :Item_code,Item_name, Price. Create an array of five Items. Create a function which accepts the Item array and modifies eachelement with an increase of 10% in the price.
11.	Define a structure that can describe a Hotel. It should have members that include name,address, grade, room charges, grade and no of rooms. Write a function to print out all hotel details with room charges less than a given value.
12.	Write a program to accept records of different states using array of structures. The structure should contain char state and number of int engineering colleges, int medical colleges, int management colleges and int universities. Calculate total colleges and display the state,which is having highest number of colleges
13.	Define a structure by name time with members seconds, minutes and hours of int type. A variable of the structure would thus represent time. If time1 and time2 are two variables of the structure type, write a program to find the difference of two times using a function.
14.	Define a structure employee with members employee name, basic pay, dearness allowance, house rent, net salary. Declare an array of 5 employees. Write a functionwhich calculates the net salary of employees and prints all employee details in descending order of their netsalary.
15.	Write a program to illustrate the use of indirection operator '*' to access the valuepointed to by a pointer.
16.	Write a program to find the largest element within an integer array using pointers.
17.	Write a program to accept string using character pointer anddisplay it.
18.	Write a program to calculate the length of the string using Pointers.
19.	Write a program to calculate the square and cube of an entered number using pointer ofa variable containing the entered number.
20.	Write functions to add, multiply, subtract two numbers and call the functions from

	themain program using a function pointer.
21.	Write a program to display contents of file on the screen. The program should ask for filename. Display the contents in capital case.
22.	Write a program to find size of the file.
23.	Write a program to combine contents of two files in a third file. Add line number at thebeginning of each line.
24.	Write a program to display number 1 to 100. Redirect the output of the program to textfile.
25.	Write a program to write contents of one file in reverse into another file.
26.	Write a program to count number of lines, words and characters in a file.
27.	Write a program to create a file called dictionary.dat that contains the information such as Name, Surname, City and Phone number. Write a program to accept a City from user and list details of persons having the given city.
28.	Write a program to copy one file to another. While doing so, all extra spaces in a file should be squeezed to one. For eg. If a file contains line "I am learning C", it should beconverted to "I am learning C".

It is recommended that each student should submit the above listed programmes duly performed at least. Few more also could be added by thefaculty if required.

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 2								
TITLE OF THE COURSE: WEB DESIGNING USING CSS,XML AND JAVASCRIPT-II								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
2		MAJOR 4	3+1 = 4	45	30	50	50	100

Course Content		
Unit	**Description**	**Lectures**
1.	**Advanced JavaScript – I** Arrays User-defined functions, String Object (length, charAt, indexOf, substr, toLowerCase, toUpperCase), Math Object (PI, abs, ceil, floor, max, min, round), Date Object (getDate, getDay, getFullYear, getMonth, getTime, getHours, getMinutes, getSeconds, setDate, setFullYear, setMonth, setTime, setHours, setMinutes, setSeconds)	9+6
2.	**Advanced JavaScript – II** - Introduction to Document Object Model (DOM), DOM Hierarchy, Understanding objects & Collections in DOM, HTML Form Hierarchy - Accessing Form elements (Text, Radio, Checkbox, Dropdown, Button), Event handling - Form Validation & E-mail Validation	9+6
3.	**CSS** - Class & ID Selector - CSS Pseudo - CSS Font Properties - CSS Text Properties - CSS Background Properties - CSS List Properties - CSS Margin Properties - CSS Comments - Border Property - Background & Gradient Property - Drop Shadow Property - 2D & 3D Transform Property - Transition Property - Box Sizing Property - Position Property	9+6
4.	**Bootstrap Framework** - Bootstrap Layout (Container, Row, Columns, Responsive classes, Offset Column, Reordering Columns) - Features of Bootstrap - Bootstrap Content (Typography, Tables, Images, Forms)	9+6

5.	**Bootstrap Components** (Navbar, Navs and tabs, Dropdowns, Buttons, Button Groups, Breadcrumb, Pagination, Labels, Alerts, Progress Bars, Accordion, Card, Modal)Bootstrap Utilities (Colors, Background, Borders, Display, Overflow, Position, Spacing, Text, Vertical align)	9+6
	Total Lectures	**45+30**

Reference Books:

1. HTML in 10 steps or less - Laurie Ann Ulrich, Robert G. Fuller
2. Internet: The Complete Reference –Young.
3. World Wide Web Design with Html -C Xavier.
4. Internet for Every One –Leon.
5. Practical Html 4.O -Lee Philips.
6. MCSE Networking Essential Training Guides.
7. Benjamin Jakobus, Jason Marah, "Mastering BootStrap 4" 2nd Edition
8. Matt Lambert "Learning BootStrap 4", Packt Publishing

PRACTICAL:

List of Sample Programs of Web Designing
1. WAP to take two values from textbox and find sum using HTML and JS.
2. WAP to take value from textbox and find whether it is even or odd using HTML and JS.
3. WAP to value from textbox and find factorial using HTML and JS.
4. WAP to value from textbox and find whether it is prime number or not using HTML and JS.
5. WAP to demonstrate onclick and ondblclick event using HTML and JS
6. WAP to demonstrate onblur and onchange event using HTML and JS
7. WAP to demonstrate onMouseOver and onMouseOut event using HTML and JS.
8. WAP to demonstrate onKeyUp and onKeyDown event using HTML and JS
9. WAP to demonstrate onSubmit event using HTML and JS
10. WAP to validate textbox value for Required Field Validation
11.WAP to validate textbox value for email validation
12. WAP to validate textbox value for range validation.
13. WAP to demonstrate hover selectors in CSS and HTML
14. WAP to demonstrate id and class selectors in CSS and HTML
15. WAP to demonstrate nth-child selectors in CSS and HTML
16. WAP to demonstrate universal selectors in CSS and HTML
17. WAP to demonstrate Box Sizing Properties in CSS and HTML
18. WAP to demonstrate BootStrap container in HTML
19.WAP to demonstrate Bootstrap classes row and column in HTML
20. WAP to demonstrate BootStrap navbar and nav in HTML
21. WAP to demonstrate BootStrap Cards in HTML
22. WAP to demonstrate BootStrap alerts in HTML
23. WAP to demonstrate BootStrap progressbar in HTML
24. WAP to demonstrate BootStrap Accordian in HTML
25. WAP to demonstrate BootStrap Modals in HTML

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 2								
TITLE OF THE COURSE: DATA STRUCTURES USING C								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
3		MINOR 2	3+1 = 4	45	30	50	50	100

Course Content		
Unit	**Description**	**Lectures**
1.	**Data Structures** - Definition - Data types -Abstract Data types(Primitive), User-Defined Data types (Non- primitive) - Classification of Data Structures and details of each classification **Stack** - Introduction (Idea of the Stack) - Operations of Stack (Algorithm and Explanation) - Applications of Stack - Recursion - Conversion: Infix to Postfix using manually and Stack	9+6
2.	**Queue** - Introduction (Idea of the Queue) - Types of Queue - Operation of Simple Queue (Algorithm and Explanation) **Linked List** - Comparison of Array and Linked list - Types of Linked List (Singly Linked list, Doubly Linked List) - Representation of Linked List	9+6
3.	**Non Linear Data Structures(Tree)** - Introduction - Terminology - Binary Tree - Binary Tree Creation and Traversal - Types of Binary Tree - Full Binary Tree - Complete Binary Tree - Binary Search Tree - Expression Tree - Threaded Binary Tree - Heap Tree	9+6
4.	**Non Linear Data Structures(Graph)** - Introduction - Terminology - Representation of Graph (Adjacent Matrix and Linked List) - Traversal of Graph (Breadth first Traversal, Depth first Traversal) - Application of Graph (Spanning Tree, Prim's Algorithm, Kruskal's Algorithm)	9+6

5.	**Sorting** - Bubble sorting - Insertion sorting - Quick sorting - Merge sorting - Selection sorting **Basic searching technique** - Sequential searching - Binary searching	9+6
	Total Lectures	**45+30**

Reference Books:

1. Data Structure through C/C++ Author :Tennaunbuam.
2. Let us C Author :Kanitkar.
3. Pointer in C Author :Kanitkar.
4. Data and File Structure Author : Trembley &Sorrenson

PRACTICAL:

Sr. No.	Program Definition
1.	Write program to implement following operations using Singly link list. - Create - Insert at first - Insert at Last - Display the list
2.	Write program to implement following operations using Singly link list. - Create - Delete at first - Delete at Last - Display the list
3.	Write a Program to implement Sequential Search.
4.	Write a Program to implement Binary Search.
5.	Write a program to implement Bubble sort.
6.	Write a program to implement Selection sort.
7.	Write a program to implement Merge sort.
8.	Write a program to implement Quick sort.
9.	Write a program to implement Insertion sort.
10.	Write a program to implement following operations in STACK. • PUSH • POP • PEEP • CHANGE
11.	Write a program to implement recursion.
12.	Write a program to reverse the string using the stack.
13.	Write a program to implement Simple Queue. • ENQUEUE • DEQUEUE • Traversal (display)
14.	Write a program to implement following operations on Binary Search Tree using LinkedList. • Creation • Insertion • Traversal(In-order, Pre-order, Post-order)

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 2								
TITLE OF THE COURSE: DISCRETE MATHEMATICS								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
4		MDC 2	4	60	NIL	50	50	100

Course Content		
Unit	**Description**	**Lectures**
1.	**Set Theory**: Basic Concepts of Set Theory: Definitions, Inclusion, Equality of Sets, Cartesian product, The Power Set, Some operations on Sets, Venn Diagrams, Some Basic Set Identities	12
2.	**Relations and Ordering:** Properties of binary relations in a Set, Relation Matrix and the Graph of a Relation, Equivalence Relations, Compatibility Relations, Compositionof Binary Relation.	12
3.	**Permutations and Combination:** Introduction, Rule of Sum and Product, Kramp's Factorial Notation, Combination – Permutations, Important Deductions,Permutations with Repetition of object,Circular permutation, Restricted Permutation, Principle of Mathematical Induction.	12
4.	**Functions**: Introduction & definition, Co-domain, range, image, value of a function; Examples, surjective, injective, bijective; examples; Composition of functions, examples; Inverse function, Identity map, condition of a function to be invertible,examples; Inverse of composite functions, Properties of Composition of functions	12
5.	**Propositional Logic**: Definition, Statements & Notation, Truth Values, Connectives,Statement Formulas & Truth Tables, Well-formed Formulas, Tautologies,Equivalence of Formulas, Duality Law, Tautological Implications, Examples **Predicate Logic:** Definition of Predicates; Statement functions, Variables, Quantifiers, Predicate Formulas, Free & Bound Variables; The Universe of Discourse,Examples, Valid Formulas & Equivalences, Examples.	12
	Total	**60**

Reference Books:

1. Discrete Mathematical Structures-Bernard Kolman, Robert C. Busby, Sharon C. Ross, 4th Edition, Pearson Education Asia.
2. Discrete Mathematics-Richard Johnsonbaugh, 5th Edition, Pearson Education,Asia.
3. Elements of Discrete Mathematics, Second Edition, Tata McGraw Hill.
4. Discrete Mathematics, SeymonLipschutz & Max Lans Lipson, Tata McGraw Hill.
5. J. P. Tremblay and R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw-Hill,1997.

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 2								
TITLE OF THE COURSE: PERSONALITY DEVELOPMENT & CORPORATE SKILLS								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
5		AEC 2	2	30	NIL	25	25	50

Course Content		
Unit	**Description**	**Lectures**
1.	**INTRODUCTION TO PERSONALITY** Definition of Personality, Pillars of personality, Self-Introspection, Self-Assessment,Self-Appraisal, Self-Development and Self Interrogation	10
2.	**A NEW APPROACH TO SELF IDENTIFICATION AND SELF ASSESSMENT** Introduction, Self-Centric Process, Self-Belief System, Self-Concept System, Scale of Assessment, Self-Qualifying Factors, Self-Identification Matrix, Packaging of Self Identity	10
3.	**INTERPERSONAL RELATIONSHIPS** Define Interpersonal Relationships, Nature and Scope of Interpersonal Relationships,difference between aggressive, submissive and assertive Behaviours, Lateralthinking, Enhancing Interpersonal Skills to improve relationships.	10
	Total	**30**

Reference Books:

1. Enhance your employability: A Practical manual to career planning, interview processand group discussion- Dr. V. K Verma & Prof. N. K Chadha.
2. Understanding Psychology: By Robert S Feldman. (Tata McGraw Hill Publishing).
3. Business Communication (Principles, Methods and Techniques) Nirmal Singh - Deep & Deep Publications Pvt. Ltd., New Delhi.
4. Effective Business Communication – H.Murphy.
5. Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli - Sultan Chand& Sons, New Delhi.
6. Hurlock Elizabeth B Personality Development Tata Mcgraw Hill New Delhi.
7. Mcgrath Eh Basics Management Skills For All Printish Hall Of India Pvt Ltd NewDelhi.
8. Mitra Barun(2016). Personality development and soft Skills.Oxford University Press.
9. Personality Development and Career management: By R.M.Onkar (S ChandPublications).
10. Personality Development and Career management: By R.M.Onkar (S Chand Publications).
11. Stephen P. Robbins and Timothy A. Judge (2014), Organizational Behavior 16th Edition: PrenticeHall.
12. Seven Habits Of Highly Effective People – Stephen Covey.
13. Social Psychology: By Robert S Feldman. (Tata McGraw Hill Publishing.
14. Three Basic Managerial Skills For All – Hall Of India Pvt Ltd New Delhi.

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 2								
TITLE OF THE COURSE: OPERATING SYSTEMS								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
6		SEC 2	2	30	NIL	25	25	50

Course Content		
Unit	**Description**	**Lectures**
1.	**Introduction to Operating System** - What is Operating System? - Operating system software - Types of Operating System **Processor Management** - Job Scheduler, Process Scheduler - Job and Process Status - Process Control Block - Process Scheduling Algorithms: • First Come First Serve, Shortest Job Next, Priority • Scheduling, Shortest Remaining Time, Round Robin	10
2.	**Processor Synchronization** - What is parallel Processing? - Process Synchronization Software-test and set, Wait and Signal - Semaphores - Process Cooperation-Producers and consumers	10
3.	**Deadlock** - Seven cases for dead lock - Conditions for Deadlock - Strategies for handling Deadlocks - Starvation (Dining Philosophers Problem) **Device Management** - Types of System Devices - Component of I/O subsystem - Device Handler Seek Strategies • FCFS • SSTF	10
	Total	**30**

Reference Books:

1. Operating Systems By Flynn, Cengage learning
2. Operating Systems: Internals and Design Principles, 5/E By William Stallings, Pearson Higher Education

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 2								
TITLE OF THE COURSE: ENVIRONMENT STUDIES								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
7		VAC 2	2	30	NIL	25	25	50

Course Content		
Unit	**Description**	**Lectures**
1.	**INTRODUCTION** **Environmental Studies:** Meaning, Nature, Scope, Importance and Limitations, Need for environmental education Ecosystems; Biodiversity and NaturalSystems; Natural Cycles.	10
2.	**ECOLOGY AND ECOSYSTEMS** - Concept of ecology and ecosystem, Structure and function of ecosystem; Energy flow in an ecosystem; food chains, food webs; Basic concept of population and community ecology; ecological succession. - Characteristic features of the following: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem Aquatic ecosystems (ponds, streams, lakes, wetlands, rivers, oceans, estuaries)	10
3.	**NATURAL RESOURCES** Concept of Renewable and Non-renewable resources, Land use change; Land degradation, soil erosion and desertification, **Deforestation**: Causes, consequences and remedial measures,	10
	Total	**30**

Reference Books:

1. Enhance your employability: A Practical manual to career planning, interview processand group discussion- Dr. V. K Verma & Prof. N. K Chadha.
2. Understanding Psychology: By Robert S Feldman. (Tata McGraw Hill Publishing).
3. Business Communication (Principles, Methods and Techniques) Nirmal Singh - Deep & Deep Publications Pvt. Ltd., New Delhi.
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13. Social Psychology: By Robert S Feldman. (Tata McGraw Hill Publishing.
14. Three Basic Managerial Skills For All – Hall Of India Pvt Ltd New Delhi.

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 2								
TITLE OF THE COURSE: BUSINESS INCUBATION								
Sr. No.	**Course Code**	**Course Category**	**Course Credit**	**Teaching Hours**	**Practical Hours**	**Internal Exam Marks**	**External Exam Marks**	**Total Marks**
7		VAC 2	2	30	NIL	25	25	50

Course Content		
Unit	**Description**	**Lectures**
1.	**INTRODUCTION** Business Incubation- Concept and Principles; Incubator and Incubation; Pre- requisites of incubator; Development of an incubator; Types of incubators; Corporate and educational incubators. Incubation and Entrepreneurship. Business incubation models and success factors. Virtual business incubation. Agribusiness incubation. Government Policies and Programmes, Role of business incubation in the economy.	10
2.	**INCUBATION PROCESS & INCUBATOR BUSINESS ENVIRONMENT** Process of business incubation and business incubator; Pre-incubation and post-incubation; Idea lab; Business plan structure; Value proposition. Role of business incubation in start-up development, Managing business incubator; Financing business incubator, Services of incubators.	10
3.	**PLANNING AN INCUBATOR** Feasibility study; Team formation and team building; Examining sample business idea and writing business plans; Developing business plan; Business incubationmarketing and stakeholder management; Understanding investor/lender's perspective and presenting business plan; Valuation of business plan and elevator pitch, Policy formulation for entry and exit, Roles and responsibilities of key players.	10
	Total	**30**

Reference Books:

1. Adkins, D. (2002). A Brief History of Business Incubation in the United States. Athens: National Business Incubation Association.
2. Gerl, E. (2000). Brick and Mortar, Renovating or Building a Business Incubation Facility. Athens: National Business Incubation Association.

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEMESTER – 2	
8	Vocational/Exit Courses

VOCATIONAL EDUCATION AND TRAINING: Vocational Education and Training will form an integral part of the undergraduate programme to impart skills along with theory and practical. Students can do one vocational course of 4 credits as a part of exit course.

Students can earn extra credits through vocational courses from SWAYAM (https://swayam.gov.in).

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