BHARATI VIDYAPEETH

DEEMED TO BE UNIVERSITY

PUNE, INDIA

FACULTY OF MANAGEMENT STUDIES

Board of Studies in Computer Applications

Structure of Bachelor of Computer Applications

Programme

(Under Choice Based Credit System)

To be effective from 2018-19 at Part I

BHARATI VIDYAPEETH (DEEMED TO BE UNIVERSITY), PUNE
FACULTY OF MANAGEMENT STUDIES
Board of Studies in Computer Applications and Systems Studies
Structure of Bachelor of Computer applications Programme
(Under Choice Based Credit System)
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1. Introduction:

The BCA Programme is a full time 150 Credits program offered by Bharati Vidyapeeth (Deemed to be University), Pune and conducted at its management institutes in Karad, Kolhapur, Pune, Sangli, and Solapur. All the five institutes have excellent faculty, Laboratories, Library, and other facilities to provide proper learning environment. The University is reaccredited by NAAC with an 'A+' grade. The expectations and requirements of the Software Industry, immediately and in the near future, are visualized while designing the BCA programme. This effort is reflected in the Vision and Mission statements of the BCA programme. Of course, the statements also embody the spirit of the vision of Late Dr. Patangraoji Kadam, the Founder of Bharati Vidyapeeth and Chancellor, Bharati Vidyapeeth University which is to usher in "Social Transformation through Dynamic Education."

2. Vision statement of BCA programme:

To create high caliber solution architects and innovators for software development.

3. Mission statement of BCA programme:

To teach 'things, not just words', 'how to think', and 'how to self-learn'.

4. Objectives of BCA programme:

The main objectives of BCA Programme are to prepare the youth to take up positions as system analysts, system engineers, software engineers, programmers and of course as versatile teachers in any area of computer applications. Accordingly the course curriculum aims at developing 'systems thinking' 'abstract thinking', 'skills to analyze and synthesize', and 'skills to apply knowledge', through 'extensive problem solving sessions', 'hands on practice under various hardware/software environments', 'four minor projects and 'one semester full-time internship project'. In addition, 'social interaction skills', 'communication skills', 'life skills', 'entrepreneurial skills', and 'research skills' which are necessary for career growth and for leading quality life are also imparted.

5. Learning Outcomes from the BCA programme:

At the end of the course the student should be able to:

(a) Analyze problems and design effective and efficient software solutions.

(b) Develop software under latest Application Development Environments.

(c) Learn new technologies with ease and be productive at all times.

(d) Read, write, and contribute to technical literature.

(e) Work in teams.

(f) Be a good citizen in all respects.

6. Eligibility for Admission to this course:

Admission to the course is open to any candidate who has passed (10+2) or equivalent examination of any recognized board.

Subject to the above condition, the final admission is based solely on the merit at the All India entrance test (BU-MAT) conducted by Bharati Vidyapeeth (Deemed to be University, Pune).

7 Duration of the course:

The duration of this course is three years divided in to six semesters or a minimum of 150 credits whichever is later. The medium of instruction and examination will be only English.

Grading System for Programmes under Faculty of Management Studies:

8 Grade Points:

The Faculty of Management Studies, Bharati Vidyapeeth University has suggested the use of a 10-point grading system for all programmes designed by its various Board of Studies. A grading system is a 10-point system if the maximum grade point is 10. The system is given in Table I below.

Table I: The 10-point Grading System Adapted for Programmes under FMS

Range of Percent Marks	**[75, 100]**	**[70,74. 9]**	**[65, 69.9]**	**[60, 64.9]**	**[55, 59.9]**	**[50, 54.9]**	**[45, 49.9]**	**[40, 44.9]**	**[00, 39.9]**
Grade Point	**10.0**	**9.0**	**8.0**	**7.0**	**6.0**	**5.5**	**5 0**	**4.5**	**0.0**
Grade	**O**	**A+**	**A**	**B+**	**B**	**C**	**+ C**	**D**	**F**

9 **Scheme of Examination**: For some courses there is Internal Assessment (IA) conducted by the respective institutes as well as a University Examination (UE) at the End-of-the Term. IA will be of **40 marks** and UE will be conducted out of **60 marks** and converted to grade points and grades using Table I above.

For courses having only Continuous Assessment (CA) the respective institutes will evaluate the students in varieties of ways, three or four times, during the term for a total of 100 marks. Then the marks will be converted to grade points and grades using the Table I above.

10 **Performance in a Course**: The performance in a course is indicated by a Grade Point Index (GPI). For courses with both UE and IA components, the GPI is computed as a weighted average of grade points in UE and IA with respective weights 60% and 40%. That is,

GPI = 0.6* GP(UE) + 0.4*GP(IA),

Where GP (UE) is the grade point corresponding to UE and GP (IA) is the grade point corresponding to IA. As an illustration, suppose that a student obtains 40% in UE and 100% in IA. Then GP (UE) = 4.5 and GP (IA) = 10.0, so that GPI in the course would be 0.6*4.5+0.4*10.0 = 2.7+4.0 = 6.7 (This would correspond to 63.5 %.)

For courses with CA only, the grade point itself would be the GPI.

11 Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

At the end of each term, SGPA is calculated as the weighted average of all GPI of courses in the current semester in which the student has passed, the weights being the credit values of respective courses. Similarly, at the end of each semester, CGPA is calculated as the weighted average of all GPI of all courses in which the student has passed **up to** the current Semester.

12 Standards of Passing:

a) In order to pass in a course, a student must obtain a minimum grade point of 4.5 at the UE and also a minimum GPI of 4.0 in the course. There is no separate passing criterion in IA. Thus, a student may fail in a course either because he/she failed at UE or he/she failed in aggregate performance of UE and IA. A student who passes in a course is said to have completed the credits assigned to the course.

(b) A student who has passed in all heads of passing in Part-I, Part-II and Part-III with minimum of 150 credits will be awarded the degree of Bachelor of Computer Applications (BCA) with the honors according to Table II.

Table II: CGPA Ranges for Class Declaration

Range of CGPA	[4.00, 4.99]	[5.00, 5.49]	[5.50, 5.99]	[6.00, 7.99]	[8.00, 10.00]
Division	Pass Class	Second Class	Higher Second Class	First Class	First Class with Distinction
Range of Marks(%)	[40.0, 49.9]	[50.0, 54.9]	[55.0, 59.9]	[60.0, 69.9]	[70.0, 100.0]

13. Equivalence between CGPA and Percent Marks: Any stakeholder may convert GPI of a course, SGPA, or CGPA to an equivalent percent marks using the formula

$$\text{marks}(\%) = \begin{cases} 10 * \text{CGPA} & \text{if CGPA in } [4.00, 6.00] \\ 5 * \text{CGPA} + 30 & \text{if CGPA in } [6.00, 9.00] \end{cases}$$

25 * CGPA – 150 if CGPA in [9.00, 10.00]

The above formula gives values in the Table III. For values which are not in the Table III, use the formula directly..

Table III: CGPA and Corresponding Marks (%)

CGPA	**MARKS (%)**	**CGPA**	**MARKS (%)**	**CGPA**	**MARKS (%)**	**CGPA**	**MARKS (%)**	**CGPA**	**MARKS (%)**	**CGPA**	**MARKS (%)**
4.0	40.0	**5.0**	50.0	**6.0**	60.0	**7.0**	65.0	**8.0**	**70.0**	**9.0**	**75.0**
4.1	41.0	**5.1**	51.0	**6.1**	60.5	**7.1**	65.5	**8.1**	70.5	**9.1**	77.5
4.2	42.0	**5.2**	52.0	**6.2**	61.0	**7.2**	66.0	**8.2**	71.0	**9.2**	80.0
4.3	43.0	**5.3**	53.0	**6.3**	61.5	**7.3**	66.5	**8.3**	71.5	**9.3**	82.5
4.4	44.0	**5.4**	54.0	**6.4**	62.0	**7.4**	67.0	**8.4**	72.0	**9.4**	85.0
4.5	45.0	**5.5**	55.0	**6.5**	62.5	**7.5**	67.5	**8.5**	72.5	**9.5**	87.5
4.6	46.0	**5.6**	56.0	**6.6**	63.0	**7.6**	68.0	**8.6**	73.0	**9.6**	90.0
4.7	47.0	**5.7**	57.0	**6.7**	63.5	**7.7**	68.5	**8.7**	73.5	**9.7**	92.5
4.8	48.0	**5.8**	58.0	**6.8**	64.0	**7.8**	69.0	**8.8**	74.0	**9.8**	95.0
4.9	49.0	**5.9**	59.0	**6.9**	64.5	**7.9**	69.5	**8.9**	74.5	**9.9**	97.5

SEMESTER-WISE COURSE STRUCTURE FOR BCA
SEMESTER I

Course Number	Course Title	Credit Value	#Lec.	#Tut.	#Lab.	Weightage for EoTE/IA	EoTE
101	Fundamentals of Information Technology	4	3	1		60%/40%	Univ.
102	Algorithm and program Design	4	3	1		60%/40%	Univ.
103	C Programming - I	4	3	1		60%/40%	Univ.
104	Business organization system	4	3	1		60%/40%	Univ.
105	Business Mathematics	4	3	1		60%/40%	Univ.
106	Lab on MS-Office Suite	2	2	-	4	60%/40%	Univ.
107	Lab on C Programming - I	2	-	-	4	60%/40%	Univ.
108	General course-I Business English	1	2	-	-	Continuous Assessment	Institute
Total		25	19	5	8		

SEMESTER II

Course Number	Course Title	Credit Value	#Lec.	#Tut.	#Lab.	Weightage for EoTE/IA	EoTE
201	Computer Organization and Architecture	4	3	1		60%/40%	Univ.
202	Database Management system	4	3	1		60%/40%	Univ.
203	C Programming - II	4	3	1		60%/40%	Univ.
204	Financial Accounting	4	3	1		60%/40%	Univ.
205	Principles of Management	4	3	1		60%/40%	Univ.
206	Lab on C Programming - II	2	-	-	6	60%/40%	Univ.
207	Environmental Studies	2	3	-	-	60%/40%	Univ.
208	General Course II Business Communication	1	2	-	-	Continuous Assessment	Institute
Total		25	20	5	6		

SEMESTER III

Course Number	Course Title	Credit Value	#Lec.	#Tut.	#Lab.	Weightage for EoTE/IA	EoTE
301	Operating Systems	4	3	1		60%/40%	Univ.
302	Software Engineering	4	3	1		60%/40%	Univ.
303	DBMS II	4	3	1		60%/40%	Univ.
304	Statistics	4	3	1		60%/40%	Univ.
305	Multimedia Technology	4	3	1		60%/40%	Univ.
306	Lab on Oracle and Multimedia	2	-	-	4	60%/40%	Univ.
307	Lab on Linux Operating System	2	-	-	6	60%/40%	Univ.
308	General Course III Soft Skill Personality development	1	2	-	-	Continuous Assessment	Institute
Total		25	17	5	10		

SEMESTER IV

Course Number	Course Title	Credit Value	#Lec.	#Tut.	#Lab.	Weightage for EoTE/IA	EoTE
401	Computer Networks	4	3	1		60%/40%	Univ.
402	Software Testing	4	3	1		60%/40%	Univ.
403	Java Programming	4	3	1		60%/40%	Univ.
404	Operations Research	4	3	1		60%/40%	Univ.
405	Entrepreneurship Development	4	3	1		60%/40%	Univ.
406	Lab on Java	2	-	-	8	60%/40%	Univ.
407	Minor Project - I	2	2	-	-	60%/40%	Univ.
408	General Course IV Swach Bharat	1	2	-	-	Continuous Assessment	Institute
Total		25	19	5	08		

SEMESTER V

Course Number	Course Title	Credit Value	#Lec.	#Tut.	#Lab.	Weightage for EoTE/IA	EoTE
501	Introduction to the Internet Technologies	4	3	1		60%/40%	Univ.
502	Object Oriented Analysis and Design	4	3	1		60%/40%	Univ.
503	C# Programming	4	3	1		60%/40%	Univ.
504	Graph Theory	4	3	1		60%/40%	Univ.
505	E-commerce	4	3	1		60%/40%	Univ.
506	Lab on Internet Technology and C# Programming	2	-	-	8	60%/40%	Univ.
507	Minor Project II	2	2	-	-	60%/40%	Univ.
508	General Course V Aptitude	1	2	-	-	Continuous Assessment	Institute
Total		25	19	5	08		

SEMESTER VI

Course Number	Course Title	Credit Value	#Lec.	#Tut.	#Lab.	Weightage for EoTE/IA	EoTE
601	Information Security	4	3	1		60%/40%	Univ.
602	Data warehousing and Data Mining	4	3	1		60%/40%	Univ.
603	Web Programming	4	3	1		60%/40%	Univ.
604	Software project Management	4	3	1		60%/40%	Univ.
605	Business Analytics	4	3	1		60%/40%	Univ.
606	Lab on Web programming	2	-	-	8	60%/40%	Univ.
607	Major Project - III	2	2	-	-	60%/40%	Univ.
608	General Course VI MOOCS	1	2	-	-	Continuous Assessment	Institute
Total		25	19	5	08		

SEMESTER I

Semester I

Course Number	Course Name	L-T-P- Credits	Year of Introduction
101	**Fundamentals of Information Technology**	**3+1+0 = 4C**	**2018-19**

Course Objective:

The main objective is to introduce IT in a simple language to all undergraduate students, regardless of their specialization. It will help them to pursue specialized programs leading to technical and professional careers and certifications in the IT industry. The focus of the subject is on introducing skills relating to IT basics, computer applications, programming, interactive medias, Internet basics

Expected Outcome :

At the end of this course, student should be able to

(a) Understand basic concepts and terminology of information technology.

(b) Have a basic understanding of personal computers and their operations.

(c) Be able to identify issues related to information security.

References (Books, Websites etc) :

How to solve computer – Dromey

Computer Fundamentals by P. K. Sinha,

Suggested MOOC :

Please refer these websites for MOOCS:

NPTEL / Swayam

www. edx.com

www.coursera.com

Course Plan

Unit	Contents
1	**Introduction to Computers:** Definition, .Basics of Computer, Characteristics of computers, Evolution of Computer, Block Diagram Of a computer, Generations of Computer, Classification Of Computers, Applications of Computer, Capabilities and limitations of computer.
2	**Computer Arithmetic:** Binary, Binary Arithmetic, Number System: Positional & Non Positional, Binary, Octal, Decimal, Hexadecimal, Converting from one number system to another , 1's Complements, 2's Complements, Computer Codes, Rules and laws of Boolean algebra, Basic Gates (NOT, AND & OR)
3	**Input Output Devices:** Role of I/O devices in a computer system. Input Units: Keyboard, Terminals and its

	types. Pointing Devices, Scanners and its types, Voice Recognition Systems, Vision Input System, Touch Screen, Output Units: Monitors and its types. Printers: Impact Printers and its types. Non Impact Printers and its types, Plotters, types of plotters, Sound cards, Speakers.
4	**Storage Fundamentals:** Primary Vs Secondary Storage, Data storage & retrieval methods. Primary Storage: RAM ROM, PROM, EPROM, EEPROM. Secondary Storage: Magnetic Disks. Flash Drives, DVD, Blue-Ray disc.
5	**Software:** Software and its needs, Types of S/W. System Software: Operating System, Utility Programs Programming Language: Machine Language, Assembly Language, High Level Language their advantages & disadvantages. Application S/W and its types: Word Processing, Spread Sheets Presentation, Graphics, DBMS s/w, Algorithms and Flow Charts.
6	**Data Communication:** Communication Process, Data Transmission speed, Communication Types (modes), Data Transmission Medias, Modem and its working, characteristics, Types of Networks, LAN Topologies, Computer Protocols, Concepts relating to networking. Internet – Web Browsers, Web servers, Internet Protocol, Hyper text Transfer Protocol, Business Data Processing: Introduction, data storage hierarchy, Method of organizing data, File Types, File Organization, File Utilities.

Course Number	Course Name	L-T-P- Credits	Year of Introduction
102	**Algorithm and Program Design**	**3+1+0 = 4C**	**2018-19**

Course Objective:

To understand good principles of algorithm design, elementary analysis of algorithms, and fundamental data structures. The emphasis is on choosing appropriate data structures and designing correct and efficient algorithms to operate on these data structures.

Expected Outcome:

This is a first course in data structures and algorithm design. Students will:

- learn good principles of algorithm design;
- learn how to analyze algorithms and estimate their worst-case and average-case behaviour (in easy cases);
- become familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the description of algorithms in both functional and procedural styles;

References (Books, Websites etc) :

1. Dromey R. G. : How to Solve it by a Computer.

2. Sartaj Sahni: Data Structure, Algorithms and Applications in C++ (Ch II).

Suggested MOOC :

Please refer these websites for MOOCS:
NPTEL / Swayam
www. edx.com
www.coursera.com

Course Plan

Unit	Contents
1	**Introduction**: Concept, of Problem, Procedure and Algorithm, Algorithm Representation through Pseudo - Code and Flow - Charts, Tracing of Algorithms Such as Swapping, Counting, Finding the Sum, Product, maximum, minimum, of a list of numbers.
2	**Concept of Structured Programming and Procedure Oriented Programming:** Introduction, Concept, Basic Control Structure, Benefits of Structured Programming and Procedure Oriented Programming
3	**Design of Algorithm:** Design of algorithm for problem such as Evaluation of polynomial, Sum of first n factorials, Finding nth term of Fibonacci sequence, Finding largest and second largest of list, Determining nth root of a number, compute, GCD and Base Conversion

4	**Problem Analysis and Design 1**: Problem Analysis and Design of Algorithms for problems such as (1) Swapping (2) Counting (3) Finding the Sum, Product, maximum, minimum of a finite list of numbers, and (4) Simple variations of the above problem realization that, there may be alternative algorithm and that one algorithm may be better (in some sense) than the other.
5	**Problem Analysis and Design2**: Problem Analysis Design of Algorithms for problems such as (1) Evaluation of a polynomial (2) Sum of first n factorials (3) Finding the nth term of a Fibonacci sequence, (4) Finding the largest and second largest of a finite list, (5) Evaluating in finite series and variations of these problems, (6) Determining nth root of a number.
6	**Concept of Array, Sort and Search Technique:** Introduction of Array, Array manipulation such as removing the duplicates, Partitioning of an array, listing of prime numbers, finding prime factor of a number, The problem of search and Merge, Linear, Binary search algorithms, The Problem of Sorting, Selection, Insertion and Bubble

Course Number	Course Name	L-T-P- Credits	Year of Introduction
103	**C Programming - I**	**3+1+0 = 4C**	**2018-19**

Course Objective:

This is a first course in programming. The objective of this paper is to teach the Programming Language C. However, the process of learning a computer language will also be emphasized. Emphasis is also on semantics and problem solving.

Expected Outcome:

At the end of the course a student should be able:

- To solve a given problem using programming/algorithm
- Understand and use C libraries,
- Trace the given C program manually
- Effectively use of Arrays and functions
- Write C program for simple applications of real life using structures and Unions.

References (Books, Websites etc) :

1. Let us C - Y.Kanetkar, BPB Publications 4. Yashawant Kanetkar, let Us C, BPB Publication
2. Programming in C - Gottfried B.S., TMH 2.
3. The 'C' programming language - B.W.Kernighan, D.M.Ritchie, PHI
4. Programming in ANSI C - Balaguruswami, TMH
5. C- The Complete Reference - H.Sohildt, TMH
6. A Structured Programming Approach using C – B.A. Forouzan & R.F. Gillberg, THOMSON Indian Edition
7. Computer fundamentals and programming in C – Pradip Dey & Manas Ghosh, OXFORD

Suggested MOOC :

Please refer these websites for MOOCS:
NPTEL / Swayam
www. edx.com
www.coursera.com

Course Plan

Unit	Contents
1	**Introduction to C language** Origins of C, Character Set of C, C Tokens, Keywords and Identifiers, Constants, Variables, Data types, Declaration of variables, Declaration of variables as constant, Operators, Types of operators, Precedence and associativity, Expression, Type conversions in expressions, Input and Output functions - printf(), scanf(), getchar(), putchar(), Formatted input and formatted output.
2	**Decision Control and looping** Introduction, Control Statements- Sequential, Selection, Iteration Statements, Branching

	structure- if statement, if-else statement, Nested if-else statement, else if Ladder, Conditional operator, switch statement, Loop control structures- while loop, do-while loop, for loop, Nested for loop, Jump statements-break, continue, goto
3	**Functions** Introduction, Purpose of function, Function declaration/ Function prototype, Function definition, Function call, return statement, Function parameters, Types of functions, Call by value , Storage classes, Recursion, Examples on recursive function
4	**Arrays and Strings** Introduction to one-dimensional Array, Definition, Declaration, Initialization, Accessing and displaying array elements, Arrays and functions, Introduction to two-dimensional Array, Definition, Declaration, Initialization, Accessing and displaying array elements, Introductions to Strings, Definition, Declaration, Initialization, Input, output statements for strings, Standard library functions, Implementations with standard library functions
5	**Structures and union** Introduction to structure, Defining a structure, Declaring structure variables, Accessing structure members, nested structure, Array of structure, Array within structure, Introduction to union, Definition, Declaration, Differentiate between structure and union
6	**Pointers** Introduction to pointer, Definition, Declaring and Initializing pointer variable, Indirection operator and address of operator, Accessing variable through its pointer, Pointer arithmetic, Dynamic memory allocation, Pointers & Functions, Pointers & Array, Pointers & Structures

Course Number	Course Name	L-T-P- Credits	Year of Introduction
104	**Business Organization System**	**3-1-0 = 4C**	**2018-19**

Course Objective:

To acquaint students with fundamentals of Business Organization and management systems as a body of knowledge.

Expected Outcome :

1. Students shall know about business and structure
2. Students shall know about various forms of business
3. Students will have sound knowledge about overall business environment.

References (Books, Websites etc) :

Reference Books:

S.A. Sherlekar ,Modern Business Organization and Management – (Himalaya Publishing House)

Y.K. Bhushan ,Fundamental of Business Organization & Management – (S Chand Publishers)

Basu, C. R.; *Business Organization and Management*, Tata McGraw Hill, Publishing House, New Delhi, 1998

B S Moshal, J P Mahajan, J S Gujral, Business Organization and Management –. Galgotia Publishing Co, New Delhi

Redmond James, Robert Trager , Media Organization and Management –, Biztantra, New Delhi

Suggested MOOC :

Please refer these websites for MOOCS:

NPTEL / Swayam

www. edx.com

www.coursera.com

Laboratory Experiments:

1	**Nature of Business** Concept of Business – Meaning, Definition, Nature and Scope, Characteristics of Business. Business as an Economic Activity. Objectives of Business. Structure of Business (Classification of Business Activities. Requisites for Success in Modern Business.
2	**Evolution of Business** Beginning and development of Commerce, Evolution of Industry, Industrial Revolution, Beginning and growth of Indian Business, Industrialization in India.
3	**Forms of Business Ownership** Introduction to various forms – Factors affecting choices of an deal form of ownership, features Merits and Demerits of Sole Proprietorship – Joint Hindu Family Business – Partnership – Joint Stock Company – Co-operative Organisation, Public

	Enterprises.
4	**Formation of a Company** Stages in formation and incorporation of a company (e Promotion – incorporation and registration – Capital Subscription – Commencement of Business. - Documents of a Company i.e. Memorandum of Association – Articles of Association – Prospectus.
5	**Establishment of Business Enterprise** Various factors to be considered while starting a new Business enterprise i.e. identification of Business Opportunity – Market Assessment – Suppliers – Technology – Location – Human Resource – Finance etc. Small and Medium Enterprises – Meaning Characteristics and objectives. Role of Support Organisation such as Trade Associations and Chambers of Commerce.
6	**Organization of Trade** Channels of Distribution – Meaning, Functions and types. Internal Trade – Wholesale and Retail External Trade – Import and Export. Role and importance of support services to Business such as Transport Insurance etc. Business Combinations – Mergers and Acquisitions. Franchising. Business Process Outsourcing. Multinationals – Concept and role of MNCs

Course Number	Course Name	L-T-P- Credits	Year of Introduction
105	**Business Mathematics**	**3+1+0 =4C**	**2018-19**

Course Objective:

To give general idea about mathematics and its application in Business

Expected Outcome:

The students will be able to solve small business problems by using the concepts of Business Mathematics

References (Books, Websites etc) :

Discrete Mathematics & its Applications by Kenneth Rosen

Suggested MOOC :

Please refer these websites for MOOCS:
NPTEL / Swayam
www. edx.com
www.coursera.com

Course Plan

Unit	Contents
1	**Set Theory :** Definition of a set, Representation of elements of sets, Methods of representing sets , types of sets, operations on sets , cardinality of a set, Principle of Inclusion and Exclusion , Venn Diagram , Proof by using Venn diagram
2	**Functions and Relations** : Definition of Function, Types of Functions ,Composite Function, Relation definition, representation of relations
3	**Logic:** Propositions, Logic Operations-Negation, Disjunction, Conjunction, Conditional and Biconditional, Truth Tables of compound propositions, Translating English sentences in to logical statements and vice versa, Logic gates and circuits
4	**Matrices:** Matrix Definition, General Form, Representation of matrix in computers, Types of matrices, Operations on matrices: Addition, Subtraction and Multiplication, transpose , row / column transformations , Inverse of the matrix by Co-factor and Adjoint method, solutions to three variable problems by using matrices, application problems of matrices
5	**Permutations and Combinations:** Concept- Permutation, Combination, Sum and Product rules, problems on Permutation and combination (with wording atleast, atmost, neither nor, any one etc.)
6	**Probability:** Concept and problem solving, general probability, conditional probability, partitions, Bayes Theorm

Course Number	Course Name	L-T-P- Credits	Year of Introduction
106	**Lab on MS-Office Suite**	**2-0-4 = 4C**	**2018-19**

Course Objective:

The objective of this course is to help the student gain proficiency in text editing and formatting, spreadsheet and database management, and presentation preparation. An additional objective of the course is for the student to gain basic knowledge of modern-day computing technology.

Expected Outcome :

Upon completion of this course students will be able to:

- Demonstrate an advanced knowledge of the Word Processing package, MS Office and a knowledge of how to design & create effective and structured documents like technical reports, letters, brochures, etc.,
- Demonstrate the skills in the appropriate use of various features of the spread sheet package MS Excel and also to create useful spreadsheet applications like tabulated statements, balance sheets, statistical charts, business statements, etc.
- Demonstrate the skills in making an effective presentation with audio and video effects using the MS Excel package
- Draw graphical pictures, flow charts, block diagrams etc., using the drawing tools available in MS Word or MS Power Point and incorporate them into documents and presentations.

Suggested MOOC :

Please refer these websites for MOOCS:
NPTEL / Swayam
www. edx.com
www.coursera.com

Course Plan

Unit	
1	**Information Technology Essentials, Windows and Internet Explorer**: Verify the components of a typical computer system, Explore, maintain files, and customize the Windows operating system, Review using the Internet Explorer.
2	**MS Word:** Introduction: Introduction to MS Word, Menus, Shortcuts, Document types Working with Documents: a) Opening Files – New & Existing, Saving Files b) Formatting page and Setting Margins c) Converting files to different formats : Importing, Exporting , Sending files to others d) Editing text documents : Inserting , Deleting ,Cut, Copy, paste , Undo, Redo , Find, Search, Replace

	e) Using Toolbars, Ruler, Icons and help Formatting Documents: a) Setting Font Styles: Font selection – style, size, color etc., Type face – Bold Italic, underline, Case settings, Highlighting, Special symbols b) Setting Paragraph style: Alignments, Indents, Line space, Margins and Bullets and Numbering c) Setting Page Style: Formatting, Border & Shading, Columns, Header & footer, Setting Footnotes, Inserting manual Page break, Column break and line break, Creating sections and frames, Inserting Clip arts, inserting pictures and other files, Anchoring & Wrapping d) Setting Document Styles: Table of Contents, Index, Page Numbering, data &Time, Author etc., Creating Master Documents Creating Tables: Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, Formula Drawing: Inserting Pictures/Files etc., Drawing Pictures, Formatting &Editing pictures, Grouping and ordering, Rotating Tools: Word Completion, Spell Checks, Macros, Mail merge, Templates, Using Wizards, Tracking, Changes, Security
3	**MS Power Point:** Introduction: Opening new Presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts Creating a presentation: Setting presentation style, Adding Text to the presentation Formatting a presentation: Adding style, Color, gradient fills, Arranging objects, Adding Header & Footer, Slide background, Slide layout Adding Graphics to the presentation: Inserting pictures, movies, tables, etc into the presentation, Drawing Pictures using Draw Adding effects to the presentation: Setting Animation & transition effect, Adding audio and video Printing Handouts and Generating standalone presentation viewer

4	**MS Excel:** Introduction: Spreadsheet & its Applications , Opening spreadsheet, Menus & Toolbars & icons, Shortcuts , Using help Working with Spreadsheets: Opening a File, Saving Files, Setting Margins, Converting files to different formats : Importing, Exporting and Sending files to others Spreadsheet addressing : Rows, Columns & Cells, Referring cells and Selecting cells Entering and Editing Data: Entering Data, Cut, Copy, paste, Undo, Redo, Find, Search & Replace, Filling continuous rows, columns, Inserting -Data, cells, column, rows & sheets, Manual breaks Computing data : Setting Formula, Finding total in a column or row, Mathematical Operations(Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formula Formatting Spreadsheets: Formatting – Cell, row, column & Sheet: Alignment, Font, Border & shading, highlighting values Hiding/Locking Cells Worksheet : Sheet Name , Row & Column Headers, Row Height, Column Width, Visibility – Row, Column, Sheet , worksheet Security Formatting – worksheet: Sheet Formatting & style - background, color, Borders & shading, Anchoring objects, Formatting layout for Graphics, Clipart etc., Working with sheets : Sorting, Filtering, Validation, Consolidation, Subtotal , Creating Charts, Selecting charts, Formatting charts, label, scaling etc., Using Tools: Error Checking, Spell Checks, Macros, Formula Auditing, Creating & using Templates, Tracking changes, customization, printing worksheet
5	**Working with Excel Functions:** Concept of Functions, Commonly used functions: Sum, Max,Min, Average, Count, Today, Now, Datedif, Countif, CountA, CountBlank, Round, RoundUp, RoundDown, ABS, Sign, Ceiling, Floor, Trim, Value, Clean, sqrt, if, sumif
6	**MS Access:** What is an Access Database, Opening a Database File, Create Table, Create and modify fields of tables, Construct simple queries, Saving and Running Queries

Course Number	Course Name	L-T-P- Credits	Year of Introduction
107	**Lab on C Programming I**	**0-0-4- = 2 C**	**2018**

Course Objective :

This is companion course of C Programming I

Syllabus Broad Units:

This Companion course of C programming; Practical aspects of C programming towards problem solving is covered.

Expected Outcome :

The students will develop adequate programming skills with respect to following

1. Implement a real world problem using basic constructs of C language.
2. Develop an application using Decision making and looping
3. Make use of proper operators to solve problem.
4. Make use of Arrays and pointers efficiently and handling strings.
5. Comprehend the dynamic memory allocation and pointers in C.
6. Able to define new data types using enum, structures and typedef.

References (Books, Websites etc) :

1. Let us C - Y.Kanetkar, BPB Publications4. Yashawant Kanetkar, let Us C, BPB Publication
2. Programming in C - Gottfried B.S., TMH 2.
3. The 'C' programming language - B.W.Kernighan, D.M.Ritchie, PHI
4. Programming in ANSI C - Balaguruswami, TMH
5. C- The Complete Reference - H.Sohildt, TMH
6. A Structured Programming Approach using C – B.A. Forouzan & R.F. Gillberg, THOMSON Indian Edition
7. Computer fundamentals and programming in C – Pradip Dey & Manas Ghosh, OXFORD

Outline of Lab on C programming – I

Sr. No	Programming Exercises
1	Compilation and Executing programs Arithmetic operations Use of Symbolic constants Demonstrating the following gcc options -o, -c, -D, -l, -I, -g, -E Programs to demonstrate use of operators and Input/ output ***gcc or an equivalent compiler is assumed***.
2	Program to demonstrate the following – Branching

	– Nested Branching – Looping – Selection
3	Working with functions – Writing function prototype and definition – Using functions to solve problems (Calling a function) – Using recursion – Storage classes - Using register, extern and static
4	Arrays and Strings 1D - Linear Search, Sort 2D - Matrix operations Strings: program to do operations on string using library and user defined functions Finding length of string, String concatenation, removing extra spaces, get substring, check whether second string is part of another, converting string to lowercase, uppercase etc.
5	Structures Making use of structures to define new types(user defined types) Arrays of structure, display all elements of array and sorting of them.
6	Pointers, Programs to demonstrate working of pointer; need of pointer Pointer as parameter to function Comparison of pointer with arrays and using pointer to refer an array Creating pointer dynamically by using dynamic memory allocation Array of Pointers, Ragged Arrays, Function pointer

Course Number	Course Name	L-T-P- Credits	Year of Introduction
108	**General Course-I Business English**	**2-0-0 =1 C**	**2018-19**

Course Objective:

The objective is to introduce Business English to undergraduate students for effective communication in business organization.

Expected Outcome:

At the end of this course, student should be able to Understand how to converse in business situations and Write effective e-mails, prepare proposals & flyers, news reports.

References (Books, Websites etc) :

English Grammar and Composition – Wren and Martin

Business Communication – Urmila Rai, S.M Rai, Himalaya Publication House, 9th edition

Scott Ober – Contemporary Business Communciation, Biztara Publications

Sinha K K – Business Communication, Galgotia Publishing Company

http://www.businessenglishsite.com/general-business-english.html

http://www.englishclub.com/business-english/

http://www.better-english.com/exerciselist.html

Suggested MOOC :

Please refer these websites for MOOCS:

NPTEL / Swayam

www. edx.com

www.coursera.com

Course Plan

Unit	Contents
1	**Business English:** Introduction Protocol & Meeting People in Business; Dealing with people – at work, customer service The Basics of Customer Service - Techniques to Calm an Angry Customer Getting Back on the Good Side of an Injured Customer; negotiating with customers & suppliers, saying negative things in a positive way
2	**Business Writing** : Reporting information and ideas – preparing news reports, handouts, flyers ; writing effective proposals – outline of B-plan
3	**Electronic Mailing:** Art of mailing right; Making accepting and turning down offers; placing orders, responses, conveying regrets, sending firm reminders, acknowledging receipt.
4	**Oral proficiency :** Impromptu, conversation – courteous talk, small talk, first 5 min ; turn taking, networking, business conventions, business meetings, party talk; discussion during an interview

5	**Group discussions:** Initiating , listening, contributing, disagreeing, summarizing
6	**Telephone speaking skills:** Professional telephone etiquettes, Taking and Leaving Messages, Presentation skills-information gathering , preparing aids, rehearsals, making effective power-point presentation, summarizing.

SEMESTER II

Semester II

Course Number	Course Name	L-T-P- Credits	Year of Introduction
201	**Computer Organization and Architecture**	**3-1-0 = 4C**	**2018-19**

Course Objective:

Main objective of this paper is to learn structure and functioning of various hardware components of digital computer. Also study the interactions and communication among these hardware components.

Expected Outcome :

At the end of this course, student should be able to understand

- Simple machine architecture and the reduced instruction set computers.
- Memory control, direct memory access, interrupts, and memory organization
- Basic data flow through the CPU (interfacing, bus control logic, and internal communications).
- Number systems, instruction sets, addressing modes, and data/instruction formats.

References (Books, Websites etc) :

M Morris Mano Computer systems Architecture third edition Prentice Hall of India Publication

Suggested MOOC :

Please refer these websites for MOOCS:
NPTEL / Swayam
www. edx.com
www.coursera.com

Course Plan

Unit	Contents
1	**Introduction To Digital Computer:** Data Representation – Data Types – Complements – Arithmetic Operations – Representations – Fixed –Point, Floating – Point , Decimal Fixed – Point – Binary Codes- Logic Gates, Boolean Algebra, Map Simplification – Combinational Circuits: Half-Adder, Full Adder- Flip Flops - Sequential Circuits
2	**Introduction To Digital Components And Micro Operations:** ICs – Decoders – Multiplexers – Registers – Shift Registers – Binary Counters – Memory Unit – Register Transfer Language – Register Transfer – Bus And Memory Transfers – Arithmetic, Logic And Shift Micro Operations , Arithmetic Logic Shift Unit.
3	**Computer organization:** Instruction Codes – Computer Registers – Computer Instructions – Timing And Control – Instruction Cycle – Memory Reference Instructions – I/O And Interrupt – Machine Language – Assembly Language – Assembler.

4	**Memory Organization:** Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory – Memory Management.
5	**Central Processing Unit:** General Register Organization – Control Word – Stack Organization – Instruction Format – Addressing Modes – Data Transfer And Manipulation – Program Control, RISC
6	**Input – Output Organization:** Peripheral Devices – Input-Output Interface – Asynchronous Data Transfer – Modes Of Transfer – Priority Interrupt – DMA – IOP – Serial Communication.

Course Number	Course Name	L-T-P- Credits	Year of Introduction
202	**Database Management System**	**3-1-0 = 4C**	**2018-19**

Course Objective:

This is a foundational course on Data Modeling. The course aims to impart knowledge of the concepts related to database and operations on databases. It also gives the idea how database is managed in various environments with emphasis on security measures as implemented in database management systems.

Expected Outcome :

At the end of the course, student should be able to

A) Understand the concepts of database and techniques for its management.

B) Different Data Models at Conceptual and Logical level.

C) Differentiate between the role of DBA and Data Architect

D) Understanding Data Security standards and Methods

References (Books, Websites etc) :

1) Database System Concepts By Henry korth and A. Silberschatz

2) Database Systems Concepts, Designs and Application by Shio Kumar Singh, Pearson

3) Database Management Systems by Debabrata Sahoo ,Tata Macgraw Hill

Suggested MOOC :

Please refer these websites for MOOCS:

NPTEL / Swayam

www. edx.com

www.coursera.com

Course Plan

Unit	Contents
1	**Introduction of Database Management System:** Difference between Data, Information, Data Processing & Data Management. File Oriented Approach, Database oriented approach to Data Management, Need for DBMS, Characteristic of Database, Database Architecture: Levels of Abstraction, Database schema and instances, 3 tier architecture of DBMS, Data Independence. Database users, Types of Database System. Database Languages, DBMS interfaces.
2	**Data Modeling:** Data Models, Logical Data Modeling: Hierarchical Data Model, Network Data Model, Relational Data Model, Advantages and Disadvantages of Logical Data Modeling. Conceptual Data Modeling: Entity Relationship Model, Entities, Attributes, Types of Attributes, Relationships, Degree of relationship Set, Mapping Cardinalities, Keys, ER Diagram Notations, Roles Participation: Total and Partial, Strong and Weak Entity Set. Case studies on ERD.

3	**Normalization:** Keys: Composite, Candidate, Primary, Secondary, Foreign, Super key,CODD's Rules, Mapping conceptual model into Relational Model. Functional Dependencies, Decomposition, Lossy and Lossless Decomposition, Dependency Preserving Decomposition Advantages and Disadvantages of Normalization, Normal Forms (1NF, 2NF, 3NF,) Case Studies on Normalization.
4	**File Structures and Data Administration:** File Organization, Overview of Physical Storage Media, Magnetic Disk, RAID, Tertiary Storage, Storage Access, Data Dictionary Storage, Organization of File (Sequential, Clustering), Indexing and Hashing, Basic Concepts, indices, B+ Tree index file, B- tree index file, Static hashing, Dynamic Hashing, Data administration, Role and Responsibility of DBA
5	**Transaction and Concurrency Control** Multiprogramming and Multiprocessing, Basic Database access operations, Concept of transaction, transaction state, ACID properties, Schedules, Serializability of schedules., Concurrency Control, lock based protocols, timestamp based protocols, Multiple granularity, Multiple Version Techniques, Deadlock and its handling, Wait-Die and Wound-Wait, Deadlock prevention without using timestamps, Deadlock detection and time outs
6	**Database Recovery and security Management:** Database Recovery, Types of Failures, and Data access. Recovery and atomicity, Recovery Techniques Algorithms: Log Based Recovery, Check points, Shadow Paging, Recovery with concurrent transactions

Course Number	Course Name	L-T-P- Credits	Year of Introduction
203	**C Programming - II**	**3-1-0 = 4C**	**2018-19**

Course Objective:

- To understand file handling in C.
- To develop skills to analyze the problem given and to design & develop an efficient solution to given problem
- To develop capability to choose appropriate data structures for given problems
- To imbibe programming skills & thereby making industry ready

Expected Outcome:

After undergoing this course, student will

1. Have thorough knowledge about data structures
2. Ability to design& develop program using linear data structures& non linear data structures for solving problems
3. Ability to choose appropriate data structures for problem solving
4. Ability to use combination of these data structures for problem solving.

References (Books, Websites etc) :

1. Behrouz A. Forouzan and Richard F. Gilberg , 2nd Edition, Thomson, 2003, Computer Science A Structured Programming Approach Using C
2. Basavraj S Anami, Shanmukhappa Angadi, Sunil Kumar S Manvi, PHI Publications, 2010. A Holistic approach to learning C.
3. Andrew Tenanbaum, Thomson, 2005, Data Structures with C.Robert Kruse & Bruce Leung, Data Structures & Program Design in C, Pearson Education,

Suggested MOOC :

Data structures and Algorithms, Prof. Sudarshan Iyengar, IITRopar, 8 weeks, Rerun Feb 05, 2018 https://onlinecourses.nptel.ac.in/noc16_cs06 at NEPTEL

Course Plan

Unit	Contents
1	**Elementary Data Structures**: Basic concepts such as data object, array, and record; Operations and relations on data objects; definition of data structure; Built-in data types as examples of data structures; concept of abstract data type; notation to specify an abstract data type; concepts of pre-conditions and post-conditions; Implementation of an ADT in a language; Specification and implementation of simple data structures such as Integer, Rational, Currency, Date, Temperature, distance, Pay, Marks, Grade_card etc.
2	**Linear Data Structures:** (Representation in Memory and operations like insertion, deletion and traversal) – one and multidimensional array, Pointer arrays, single link list, circular link list, double link

	list
3	**Particular Linear Data Structures:** Representation in Memory and operations like insertion, deletion and traversal) - Stacks: Applications: implementation of recursion, factorial calculation, queues, circular queue, deques;
4	**File Handling:** Creation, reading writing in a file. Pattern Matching and Extraction of data from a file. Reading and writing from files.
5	**Hierarchical data structures** : General trees and related concepts; depth first and breadth first traversal of trees; n-ary trees and important properties of n-ary trees; binary trees and their properties; binary tree traversal algorithms.
6	**The problem of search and Sorting** : Llinear and binary search and their efficiency; Hash tables, The standard sort algorithms (Bubble/insertion/selection) and their efficiencies; Merge sort and quick sort algorithms and their efficiencies.

Course Number	Course Name	L-T-P- Credits	Year of Introduction
204	**Financial Accounting**	**3-1-0 = 4C**	**2018-19**

Course Objective:

1. To impart basic accounting knowledge
2. To lay a foundation for further study of accounting at higher level
3. To enable the students to understand basic accounting principles, practice and its applications in modern business activities.

Expected Outcome :

- The knowledge of accounting and its principles at basic level.
- Practical's in Tally and Excel for Financial Accounting assignments

References (Books, Websites etc) :

1. Dr. S. N. Maheshwari , Financial Accounting For Management: (Vikas Publishing House)
2. Robert Anthony, David Hawkins, Business Accounting. (Tata McGraw –Hill)
3. M.G.Patkar, Book-Keeping & Accountancy. Std XI(FYJC) Commerce
4. Anil Chowdhry , Fundamentals of Accounting & Financial Analysis (PearsonEducation)
5. M.E.Thukaram Rao, Accounting for Managers.(New Age International Publishers)

Suggested MOOC :

Please refer these websites for MOOCS:
NPTEL / Swayam
www. edx.com
www.coursera.com

Course Plan

Unit	Contents
1	**Introduction:** Need for Accounting, Meaning and definition of book keeping, System of Book keeping. Financial Accounting-definition, Scope and objectives. Accounting v/s Book Keeping. Limitations of Financial Accounting, End users of financial statement.
2	**Accounting Principles, Concepts and Conventions:** Accounting Principles-definition and importance, Accounting Concepts and Conventions, Branches of accounting.
3	**Journal and ledger:** Journal-importance and utility, classification of accounts, journalizing of transactions. Ledger- meaning and utility, posting and balancing of account
4	**Subsidiary Books And Trial Balance:** Cash book, purchase book, sales book. Trial Balance- meaning and purpose, preparation of a trial balance.
5	**Preparation of final accounts:** Preparation of Trading and Profit & Loss Account and Balance Sheet of sole proprietary business.

6	**Computerized Accounting:** Computers and Financial application, Accounting Software packages. (Orientation level)

Course Number	Course Name	L-T-P- Credits	Year of Introduction
205	**Principles of Management**	**3+1+0 = 4C**	**2018-19**

Course Objective:

To understand the concepts in Management and to develop the skills related to practice of management.

Expected Outcome:

To understand the functions and processes of business management.

References (Books, Websites etc) :

1. Heinz Weihrich & Harold Koontz , Principles and Practice of Management
2. Tripathi & Reddy , Principles of Management
3. Dr. L.M.Prasad, Principles of Management
4. Richard Daft., Management. Thomson South Western Publishers, Australia

Suggested MOOC :

Please refer these websites for MOOCS:
NPTEL / Swayam
www. edx.com
www.coursera.com

Course Plan

Unit	Contents
1	**Introduction to Management:** Definitions and Meaning of Management, Characteristics of Management, Management Vs. Administration, Levels of Management, Functions of management, Scope and Importance of Management, Henry Fayol' s contribution to Management, Fredrick Taylor's contribution to Scientific Management, Social Responsibility of Management.
2	**Planning:** Meaning, Steps in planning process, Nature of planning , Types of plans, Mission and Objectives, Process of setting Objectives, Management by Objectives, Decision making - process.
3	**Organizing:** Meaning, Process of Organizing, Organization Structure, Forms of Organization
4	**Staffing:** Recruitment and its Sources, Selection process, Payment of Wages and Salaries, Incentives - Types, Motivation - Positive and Negative motivation.
5	**Directing:** Defining Leadership, Types of leadership. Authority & Responsibility, Delegation of Authority, Decentralization - Determinants of decentralization, Distinction between Delegation and Decentralization.

6	**Controlling:** Meaning, Characteristics of Control, Process of Controlling, Modern methods of controlling, Requirements for Effective Control, Relationship between Planning & Controlling. Use of IT in Controlling. Zero Based Budgeting and Management audit.

Course Number	Course Name	L-T-P- Credits	Year of Introduction
206	**Lab on C Programming -II**	**0-0-6 = 2C**	**2018-19**

Course Objective :

This is companion course of C Programming II

Syllabus Broad Units:

This Companion course of C programming II; Practical aspects of C programming towards problem solving is covered.

Expected Outcome :

The students will develop adequate programming skills with respect to following

1. Define basic data structures such as Date, Currency and Rational; and using it.
2. Defining and using and updating Liner data structures : arrays and Linked List
3. Should define data types such as stack, queue and List
4. Able to read and write data into files.
5. Able to define hierarchical data types; manipulate and use it.
6. Able to understand searching and sorting mechanism and use various algorithms on it.

References (Books, Websites etc) :

1. Behrouz A. Forouzan and Richard F. Gilberg , 2nd Edition, Thomson, 2003, Computer Science A Structured Programming Approach Using C
2. Basavraj S Anami, Shanmukhappa Angadi, Sunil Kumar S Manvi, PHI Publications, 2010. A Holistic approach to learning C.
3. Andrew Tenanbaum, Thomson, 2005, Data Structures with C.Robert Kruse & Bruce Leung, Data Structures & Program Design in C, Pearson Education,

Lab on C programming -II

Sr. No	Programming Exercises
1	Elementary Data Structures - Write a program having functionality of one dimension and two dimensionarrays with use of simple data types such as Integer, Float, Date etc. - Write a program wherein mathematical calculations involves such as average, percentage calculation, Factorial calculation and Matrix multiplication - Write program for structure implementation for array and pointers. - Create a object of the class to achieve various functionalities of accounting such as Net Pay calculation, Tax dedication, Gross pay etc.
2	Linear Data Structures

	- Demonstrate various functionalities for Link list, Circular link list and double link list with the reference of array and pointer. - Write a C program to insert and delete string / integer data from specific place of linked list. - Search a specific string/ integer in a given data set also find how many time it occurs or repeats in a set given
3	Particular Linear Data Structures - Write program for implementation of recursion - Demonstrate Insertion, Deletion and Searching functionalities with their nomenclatural for – o Stack o Queues o Circular Queues - Do necessary assumption for implementation of it
4	File Handling - Program to create and write data into files - Program to read data from files. - Programs on pattern matching on data of files and using this pattern matching at the time of reading and writing data into file
5	Hierarchical data structures - Programs for defining data structure to represent a tree. Creating tree and adding data/nodes into it. - Programs to traverse tress: DFS, BFS and other - Deleting and nodes in tree
6	The problem of search and Sorting - Programs to use liners/sequential searching and binary searching - Programs to implement standard sorting algorithms with efficiency measurement - Reading data form and using it with various sorting algorithms

Course Number	Course Name	L-T-P- Credits	Year of Introduction
207	**Environment Studies**	**3-0-0 = 2C**	**2018-19**

Course Objective:
To Understand and the nature and function of the natural environment affecting society.

Expected Outcome :
Understand the importance of Environment in the life of living things.

References (Books, Websites etc) :

- Agrawal K.C.:Environmental Biology:Nidhi Publishers Ltd(2001)
- Bharucha Erach: The Biodiversity of India: Mapin Publishing Pvt. Ltd.
- Jadhav H and Bhosale V.M.: Environmental Protection and Laws: Himalaya Publishing House.
- Miller T.G. Jr.: Environmental Science: Wadsworth Publishing Co.

Suggested MOOC :

Course Plan

Unit	Contents
1	**The multidisciplinary nature of environment studies:** Definition, scope and importance-need of public awareness. **Natural Resources**: **Renewable and non-renewable resources:** **Forest resources:** Use and over- exploitation, deforestation. Case studies. Timber extraction, mining, dams and their effects on forest and tribal people. **Water resources:** Use and over-utilization of surface and groundwater, floods, droughts, conflicts over water, dams- benefit and Problems. **Mineral Resources:** Use and exploitation 'environmental effects of extracting and using mineral resources, case studies. **Food resources:** World food problems, changes caused by agriculture. Fertilizer-pesticide problems, water logging, salinity, case studies. **Energy resources:** Growing energy needs, renewable and non-renewable energy resources, use of alternative energy sources. **Land resources:** Land as resources, land degradation, man induced landslides, desertification. Role of individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles
2	**Ecosystem:** Concept of ecosystem, structure and function of an ecosystem, producers, consumers and decomposers .Energy flow in the ecosystem, Ecological succession, food chains, food webs and ecological pyramids, introduction, types, characteristics features structure and function of the following ecosystem, forest ecosystem ,grassland ecosystem, Desert ecosystem, Aquatic ecosystems, ponds, stream, lakes, rivers, estuaries.

3	**Biodiversity and its conservations:** Introduction, Definition: genetic, species and ecosystem diversity, Biogeographically classification of India, value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option vales, India as a mega diversity nation, Hot-Spots of biodiversity, Threats to biodiversity: habitat loss, poaching of wildlife, Man wildlife conflicts, Endangered and endemic species of India, Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity.
4	**Environmental Pollution:** Definition- Causes, effects and control measures of:-Air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, and nuclear hazards .Soil waste management: cause, effects and control measures of urban and industrial waste. Role of an individual in prevention of pollution. Pollution case studies. Disaster management: floods, earthquakes, cyclone and landslide.
5	**Social issues and Environment:** From unsustainable to sustainable development, urban/problems related to energy, water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people; its problems and concerns Case Studies, Environment ethics: Issues and possible solutions ,wasteland reclamation, Consumerism and waste products, Environment protection Act, Air(presentation and Control of Pollution)Act. Water (Prevention and Control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness.
6	**Human Population and the Environment:** Population growth, variation among nations, population explosion-Family Welfare Programme. Environment and Human health. Human Rights Value Education. HIV/AIDS Women and Child Welfare. Role of Information Technology in Environment and human health.

Course Number	Course Name	L-T-P- Credits	Year of Introduction
208	**General Course II Business Communication**	**2-0-0 =1C**	**2018-19**

Course Objective:
The objective is to acquaint undergraduate students with required communication skills.

Expected Outcome :
At the end of this course, student should be able to
(a) Understand the concept of communication and use of different media
(b) able to make effective written and oral communication

References (Books, Websites etc) :
Business Communication – Urmila Rai, S.M Rai, Himalaya Publication House, 9th edition
Taylor Shirley – Communication for Business, Pearson Education
http://www.englishclub.com/business-english/correspondence-samples.htm
http://www.writeexpress.com/writing-easy-letters.html
http://www.4hb.com/letters/
http://www.businessletters.in/

Suggested MOOC :
Please refer these websites for MOOCS:
NPTEL / Swayam
www. edx.com
www.coursera.com

Course Plan

Unit	Contents
1	**Basic elements of Communication :** Concept, Need and Importance, Objectives, Elements of communication, Process, Role of communication in Business, Barriers to communication- physical, semantic and language, socio-psychological, cultural barriers, principles of effective communication
2	**Types :** Downward, Upward, Horizontal, grapevine communication, Verbal and Non-verbal Channels – advantages, Methods of communication – pictures, graphs & charts, maps, signs & symbols
3	**Media and modes:** conventional modes – mail, courier, hand delivery, telegraph, telex, modern communication technology – telephone, cellular phone, sms, voice mail, Fax, e-mail, teleconferencing, websites, notice board, hoardings and bill boards, newspaper and magazines, radio, film, television, internet, Choice of media
4	**Internal and external Communication:** Purpose, Formal and Informal communication; Memoranda, Meetings, Notice of meeting, agenda, minutes, resolutions, Circulars , Press Release, Brochures and Product

	Manuals
5	**Written Communication:** Essentials of effective correspondence, formats, types of business letters – enquiries and replies, sales letters, bank correspondence, job application, Report writing- structure of a report, types of report
6	**Oral communication :** Presentation skills, Group discussion skills, Negotiation skills, interview skills, telecommunication skills