UNDERGRADUATE DEPARTMENT OF
BACHELOR OF COMPUTER APPLICATIONS
from 2018 - 2019 onwards

Sem	Part	Course Code	Course Title	Hrs	Credit	Marks
I	I	TAS/HIS/FRS	Part I	3	2	30
	II	ENS 1201	Conversational Skill	3	2	30
	III	BCA 1441	Computer Fundamentals& Applications	4	4	60
	III	BCA 1543	Programming in C	5	5	75
	III	BCA 1445	C Laboratory	4	4	60
	IIIS	MAS XXXX	Discrete Mathematics	5	4	60
	IV-NME	BCA 1241	Office automation	3	2	30
	IV-LS	BCA 1243	Digital Marketing	3	2	30
Total				30	25	**375**
II	I	TAS/HIS/FRS	Part I	3	2	30
	II	ENS 1202	Reading and Writing Skills	3	2	30
	III	BCA 1442	Operating System with Unix	4	4	60
	III	BCA 1544	Object Oriented Programming using C++	5	5	75
	III	BCA 1446	C++ Laboratory	4	4	60
	III-S	CMC XXXX	Accounting for Managers	5	4	60
	IV-NME	BCA 1242	Web Designing	3	2	30
	IV-LS	BCA 1244	Multimedia Technology and Applications	3	2	30
	V	XXXX	Ext. activity NSS/PED/SLP		1	
Total				**30+1**	**25+1**	**375**
III	I	TAS/HIS/FRS	Part I	3	2	30
	II	ENS 2201	Study Skills	3	2	30
	III	BCA 2541	Data Structure using C++	5	5	75
	III	BCA 2543	Dot net Programming	5	5	75
	III	BCA 2545	Database Management System	5	5	75
	III	BCA 2447	Dot Net Laboratory	4	4	60
	III-S	PHS XXXX	Micro Controller Programming	5	4	60
Total				**30**	**27**	**405**
IV	I	TAS/HIS/FRS	Part I	3	2	30
	II	ENS 2202	Career Skills	3	2	30
	III	BCA 2542	Software Engineering	5	5	75
	III	BCA 2544	Computer Graphics	5	5	75
	III	BCA 2546	Java programming	5	5	75
	III	BCA 2448	Java Laboratory	4	4	60
	III-S	MAS XXXX	Operation Research	5	4	60
	V	XXX 0000	Ext. activity NSS/PED/SLP		1	
Total				**30+1**	**27+1**	**405**

BCA 2

Sem	Part	Course Code	Course Title	Hrs	Credit	Marks
V	III	BCA 3641	Computer Networks	6	6	90
	III	BCA 3643	Python Programming	6	6	90
	III	BCA 3645	Internet Technology	6	6	90
	III	BCA 3547	Internet Technology Laboratory	5	5	75
	IV	BCA 3200	Environmental Studies	4	2	30
	IV LS	BCA 3243	Cyber Security	3	2	45
Total				**30**	**27**	**405**
VI	III	BCA 3642	Big Data Analytics	6	6	90
	III	BCA 3644	Fundamentals of Linux	6	6	90
	III	BCA 3646	Fundamentals of mobile computing	6	6	90
	III	BCA 3548	Project	5	5	75
	IV	HVS 3200	Human Values	4	2	30
	IV LS	BCA 3244	Advanced Excel	3	2	30
Total				**30**	**27**	**405**
Grand Total (Sem I –VI)				**180+2**	**158+2**	**2370**

S MAJOR SUPPORTIVE LS
LIFESKILL
VAL VALUE EDUCATION

NME NONMAJOR ELECTIVE
EVS ENVIRONMENTAL STUDIES

Supportive course from Other Departments

Semester	Course Code	Course Title	Hrs	Credit	Marks
I	MAS XXXX	Discrete Mathematics	5	4	60
II	CMC XXXX	Accounting for Managers	5	4	60
III	PHS XXXX	Embedded Systems and Micro Controller	5	4	60
IV	MAS XXXX	Operation Research	5	4	60

Non Major Electives

Semester	Course Code	Course Title	Hrs	Credit	Marks
I	BCA 1241	Office Automation	3	2	30
II	BCA 1242	Web Designing	3	2	30

Life Skill

Semester	Course Code	Course Title	Hrs	Credit	Marks
I	BCA 1243	Digital Marketing	3	2	30
II	BCA 1244	Multimedia Technology and Applications	3	2	30
V	BCA 3243	Cyber Security	3	2	30
VI	BCA 3244	Advanced Excel	3	2	30

BCA 1441 Computer Fundamentals and Applications 4hrs/4cr

Objective

This course provides foundational understanding of Computer Hardware, Software, Operating System, and Peripherals along with how to get the most value and impact from Computer Technology. Students will gain skills on using Internet, system Software, Application software, DBMS, Programming Languages etc.

Learning Outcome

To know the basic operations of the computer.
To clearly understand the process of the system.
To gain knowledge in peripherals.
To understand the process of programming
To give an outlook on the security measures.

Unit I

Introducing Computer Systems, Exploring Computers and their uses, interacting with the Computer System- Using Keyboard and Mouse, Seeing Hearing and Printing Data - Introduction to number system and number conversions.

Unit II

Processing Data – Transforming Data into Information, Modern CPUs, Storing Data – Types of Storage Device- Using Operating System– Operating System Basics- Networks –Data Communications, Presenting the Internet – The internet and the world, Email.

Unit III

Working with Application Software – Productivity Software, Graphics and Multimedia- Database Management – Database Management Systems, Survey of Database Systems.

Unit IV

Software Programming and Development, Creating Computer Programs, Programming Languages and the Programming Process.

Unit V

Protecting Computer and Data – Understanding the need for security Measures and taking protecting measures, Case Study – MS Office, Star Office, Open Office.

Text book:

Introduction to Computers, Peter Norton, McGraw-Hill Education, 7th edition, 2013.

Reference Books:

Computer Fundamentals, Anita Goel, Pearson Education India 2010.
Using Information Technology : A Practical Introduction to Computers & Communication, Brian Williams, StaceySawyer,2005
Fundamentals of Computers, E Balagurusamy, McGrawHill Education India 2014.
Digital Computer Fundamentals, Thomas C.Bartee, 6th Edition, Tata McGraw Hill Publishers. 2014.
Discovering Computers, Fundamentals, Gary Shelly, Misty Vermaat, 2011, Cengage

www.tutorialspoint.com/computer_fundamentals.
www.w3schools.com.

BCA 1543 Programming in C 5hrs/5cr

Objective

The aim of this course is to enable the students to understand the programming concepts help them to write programs in c language.

Learning Outcome

To understand the logic of the problem.
To analyse the given concepts and write the algorithm.
To gain knowledge in structured C programs.
To understand the Preprocessor commands and functions.
To handle file, file modes and command line arguments

Unit I

Introduction to Problem Solving- Flow charts- Tracing flow charts, Problem solving methods- Need for computer Languages- History of c – c program syntax-C character set-Identifiers and keywords- Data types-Declarations – Expressions- statements- symbolic constants

Unit II

Input-Output Statements – formatted input and output statements – unformatted input and output statements -Operators – control statements – if –if else – nested if – switch - looping statements – while – for – do while - break statement – continue statement

Unit III

Arrays –single dimension array – multi dimension array- character arrays- structures –union-pointers – function – declaration – definition – function call - call by value – call by reference – void function – recursive function – String function – math function

Unit IV

Pre-processor commands- #include - #define - #ifdef – graphics in c – graph mode initialization -circle –line- ellipse – sector – polygon – text output – text style -color function**.**

Unit V

File Handling – file open – file mode - read and write operation –file close- text file manipulation – binary fine manipulation – command line arguments - storage classes – static - auto - extern – register.

Text book:

1. Programming using C, Pandiaraja,Cijay Nicholas publications, 2005.

Reference books:

Let us C :Y.P.Kanetkar, Bpb publication, 15th edition, 2016.
Schaum's Outline of Programming with C,Byron S. Gottfried, 3rd edition, McGraw Hill Professional, 2017.
Programming in Ansi C, E. Balaguruswamy, 7th Edition, Tata McGraw Hill Publishing, 2017.

www.cprogramming.com/tutorial.html.
www.tutorialspoint.com/cplusplus.
cforbeginners.com.

BCA 1445 C Programming Laboratory 4hrs/4cr

Objective

To train the student learn a programming language and learn problem solving techniques.

Learning Outcome

While completing the course, the students acquire the knowledge to build the logic

and develop a solution for a problem statement.

Data types and Operators.

Control statements.

Looping statements.

Break and continue statements.

Arrays –single dimension arrays, multi-dimension array and character array.

Pointers.

String functions.

User Defined function - call by value, call by reference, recursive functions.

File Manipulation – binary file and text file.

User Defined Data Types – struct, union, enum, typedef.

Graphics in C.

BCA 1241 Office Automation (2T+1L) 3Hrs/2cr

Objective

The aim of this course is to understand the theory and to get hands-on experience in MS-Word, MS-PowerPoint and MS-Excel.

Learning Outcome

To create professional and academic documents.
To create and edit basic excel spreadsheets, formulas and charts.
To use PowerPoint for preparing presentation
To use Power point for creating animations.
To include images, graphs and other objects in the presentation.

Unit I

Microsoft office basics-Microsoft word: Working with word documents-Word Editing techniques-Finding and replacing-spelling and Grammar-Formatting: Making titles and stand out-adding borders and shading-setting up multiple columns-creating lists-adding headers and footers-Formatting with styles: predefined styles-custom styles-Creating tables-Working with mail merge.

Unit II

Microsoft Excel: Excel Basics-Working with excel spreadsheets-Manipulating data- selecting ranges-editing entries-formatting entries-simple calculations-naming cells and Ranges-Efficient data display-printing worksheets.

Unit III

Working with workbooks-formulas-linking worksheets: testing links-Creating charts: sizing and moving charts- updating charts- changing the type-custom chart types.

Unit IV

Microsoft PowerPoint: Working with PowerPoint presentation-Creating a presentation-Editing slides in slide view-organizing slides in outline view- using design template- merging presentations in slide sorter view.

Unit V

Adding clip art to slides- adding graphs- adding special effects- running an electronic slide show. Presentation with multimedia effects: Adding image-animating text and objects- insert sounds and movies- recording sound slide by slide.

Text book:

Comprehensive computer learning: Microsoft office 2010, Bittu Kumar, V&S publishers, 2015.

Reference books:

Quick course in Microsoft office 2000, Joyce Cox, Polly urban, Christian Dudley, and Online press Inc.

The complete Reference – Office 2000, Stephen L.Nelson, Tata McGraw Hill publishing Company Limited.

Window and MS Office 2000 with Database Concepts, N.Krishnan, SciTech publications(India) Pvt Ltd., Chennai.

BCA 1243 Digital marketing 3hrs/2cr

Objective

The aim of this course is to enable the students to learn about digital marketing world, as it available for advertising, planning for online marketing that help them to plan.

Learning Outcome

To understand the technology behind digital marketing.
To learn about domain name, hosting, e-mail marketing and social media.
To gain knowledge in game advertising.
To understand the power of digital marketing
To introduce digital marketing in various social media.

Unit I

The evolution of digital marketing - technology behind digital marketing – the need for digital marketing strategy, business and digital marketing, defining digital marketing strategy - Understanding the digital consumer- The website – the hub of the digital marketing world - Building an effective website - the main steps of building a website - choosing the domain name.

Unit II

Hosting – the website's home on the internet -Arranging the information- writing effective web content- The online marketer - about the engines - Optimizing the site for the engines - Advertising on the search engines - Black Hat, the darker side of search - Bringing in the pros -Universal search – more opportunities to rank - Website intelligence and return on investment.

Unit III

Measuring the way to digital marketing success - How information is measured - Measuring what's important, Testing, investing, tweaking, reinvesting - Action stations -Harness the power of online data, and watch the ROI take off.

Unit IV

E-mail marketing - the new direct mail–Concept of e-mail marketing - Planning the campaign Dos and don'ts of an e-mail marketing campaign- Measuring the success - a vital component of digital marketing.

Unit V

Social media and online consumer engagement–Introduction to social media - The different forms of social media - the rules of engagement - Adding social media to the own site - Online PR and reputation management - fostering a positive online image - promoting the business through online channels –Introduction to affiliate marketing - game advertising.

Text book:

Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation, Damian Ryan, Calvin Jones,Kogan Page, 4th edition, 2016.

Reference Books:

Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation, Damian Ryan, Calvin Jones,Kogan Page, 1st edition, 2008.

Internet Marketing for your Tourism, Susan Sweeney, CA, New age International (P) Limited Publishers, New Delhi, 2005.

WebSites:

www.coursera.org/specialization/digitalmarketing
www.digitalvidya.com
www.marketingsay.com

BCA 1442 Operating System with UNIX 4hrs/4cr

Objective

The aim of this course is to learn fundamental concepts and algorithms that are used in the existing operating systems.

Learning Outcome

To learn basic concepts of Operating System.
To understand the importance of Process and Threads
To solve deadlock problems using algorithms
To manage memory and Disk
To acquire knowledge about Unix commands.

Unit I

Introduction – History – Operating System Environment – Components and Goals –Input and output devices – Process Concepts - Definition of Process- Process States: Life Cycle of a Process - Process Management - Process States and State Transitions – Process Control Blocks – Process Operations – Suspend and Resume-Inter process Communication- Signals – Message Passing.

Unit II

Thread Concept - Introduction - Definition of Thread – Thread States - Life Cycle of a Thread - Thread Operations - Threading Models –Thread Implementation - Introduction Mutual Exclusion- Implementing Mutual Exclusion Software Solutions to the Mutual Exclusion Problem- Hardware Solutions to the Mutual Exclusion Problem– Semaphores.

Unit III

Monitors–Information Hiding- Monitor Example - Deadlock - Introduction- Examples of Deadlock- Deadlock Prevention- Deadlock Avoidance with Dijkstra's Banker's Algorithm- Deadlock Recovery Deadlock Strategies. Processor Scheduling – Introduction – Scheduling Levels – Pre emptive and Non Pre emptive Scheduling Algorithms.

Unit IV

Physical and Virtual Memory – Memory Organization – Management – Hierarchy – Memory Management Strategies. Fixed Partition and Variable Partition Multiprogramming – Virtual Memory Organization – Paging and Segmentation - Demand Paging and Page Replacement Strategies.

Unit V

Disk Performance Optimization – Disk Scheduling Strategies. Introduction to Unix – Listing Files and Directories Commands – Making ,Changing, Removing Directories Commands- File Management Commands – Pipes and Filters – Case studies.

Text book:

Operating System concepts, Abraham Silberschatz, Peter B Galvin, Gerg Gagne, 9th Edition, Wiley, 2016.

Reference books:

Operating Systems, H.M. Deitaland P.J. Deital, D.R. Choffnes, 3rd Edition, Pearson Prentice Hall. 2004.

Mastering unix Shell Scripting: Bash, Bourne, and Korn Shell Scripting for Programmers, System Administrators, and UNIX Gurus, Randal K. Michael, John Wiley & Sons, 2011.

UNIX and SHELL Programming –simpleNeasyBook by WAGmob , 2014.

Operating System Concepts, Silberschatz, Galvin and Gagne, Wiley India Pvt Ltd, 9th Edition, 2013.

Operating Systems: Internals and Design Principles, William Stallings, Pearson Education, 2014.

Web Sites:

www.tutorialspoint.com/operating_system.

os-book.com

www.computerhope.com/jargon/o/os.html.

BCA 1544 Object Oriented Programming using C++ 5hrs/5cr

Objective

The aim of this course is to enable the students to get understanding of the OOP Concepts, and to write, debug and run complete console applications and ultimately, become proficient.

Learning Outcome

Be able to understand the difference between object oriented programming and procedural oriented language and data types in C++.

To handle different types of functions , string and math library functions

Be able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.

Understanding Constructor, destructor, Function Overloading and operator overloading

File Handling using c++

Unit I

Introduction to Object Oriented Programming (OOP) and its basic features, namespace-Basic component of C++ program and program structure, Data types: Primitive, Derived, User Defined Data types – Operators - control and Loops.

Unit II

Function: simple functions, passing argument to functions, returning values from functions, reference arguments-recursive functions-String and String related Library function – mathematical functions.

Unit III

Objects and classes: Classes and Objects, Data Members, Member function – Object array, Object Pointer, this Pointer- Static Data Members and Static Functions – friend function – inline function.

Unit IV

Constructor - Characteristics of constructors – types of constructors - destructor – Inheritance – type of inheritance and its implementations – Polymorphism – compile time polymorphism –constructor overloading , function overloading, operator overloading – dynamic polymorphism – overriding – virtual function.

Unit V

Files and Stream: String I/O, Object I/O with multiple objects, file pointer, disk I/O with member functions – Templates – Template Methods – Template Classes – Exception Handling.

Text book:

Object Oriented Programming in C++, E. Balaguruswamy, TMH Publishing Co. Ltd., 7th Edition, 2017.

Reference Books:

The C++ Programming Language, BjarneStroustrup, Addison Wesley,3rd edition 2014.
Principles and Practice Using C++, BjarneStroustrup, Addison-Wesley Professional,2014.
C++: The Complete Reference, Herbert Schildt McGraw Hill Education; 4th edition, 2017.

Web Sites:

www.cprogramming.com/tutorial/c++-tutorial.html
www.tutorialspoint.com/object_oriented_analysis_design/index.html.
ooadonline.hpage.com.

BCA 1446 C++ Laboratory 4hrs/4cr

Objective

To train the student to learn OOP Concept and problem solving techniques using C++.

Learning Outcome

While completing the course, the students acquire the knowledge to build the logic and develop a solution for a problem statement.
Class and object.
Static data members.
Friend function.
Inline function.
Constructor – basic constructor, parameter constructor, dynamic constructor
Destructor.
Inheritance – single, multiple, multilevel, hierarchical, hybrid.
Function overloading.
Operator overloading.
Dynamic polymorphism.
Templates.
Manipulators.
File handling.

BCA 1242 Web Designing (2T+1L) 3hrs/2cr

Objective

The aim of this course deals with web page designing by using the techniques in web designing. It contains HTML, Java Script, and Dream weaver. Students will be able to design their web pages and place them in the web.

Learning Outcome

To clearly understand the web designing.
To design simple web pages using HTML
To use CSS style sheets in a web page.
Including Javascript in the HTML pages.
To host website using Dreamweaver.

Unit I

Introduction to internet: Internet architecture - Basic concepts - Web server- Web client - Internet Services- Internet protocol-Remote Access and Transactions-Electronic Mail.

Unit II

Introduction to HTML: Mark-up languages - Basic tags – Formatting –images – lists – Tables – Frames – Links – Forms. Style Sheets: CSS-Introduction to Cascading Style Sheets-Features-Core Syntax-Style Sheets and HTML Style Rule Cascading and Inheritance-Text Properties

Unit III

Dynamic HTML - Introduction to Java script: Variables – Data types – Statements-Operators - Control statements - Object based programming - Java script with HTML.

Unit IV

Java script objects - DOM - JS Browser detection – JS Cookies - JS Validation - JS Animation - JS image maps - JS Timing – JS create Objects - creating menu and slideshow using

Unit V

Dream weaver Concepts – designing Web Page with Dream Weaver. Website maintenance - types of service providers - web hosting - maintenance and other commercial issues.

Text book:

Ivan Bayross, Web Enabled Commercial Application Development using HTML, JAVASCRIPT, DHTML and PHP, BPB Publications, 4th Edition 2010.

Reference books:

Html5 Black Book by Kogent Learning Solutions Inc. Released 2011.
Jennifer Robbins, Learning Web Design, 4th Edition, O'Reilly Media, 2012
Robert. W. Sebesta, “Programming the World Wide Web”, fourth Edition, Pearson Education, 2007.

Web Sites:

www.w3schools.com
www.tutorialspoint.com
www.teacherclick.com

BCA 1244 Multimedia Technology and Applications (2T+1L)3Hrs/2cr

Objective

The aim of this course is to enable the students to learn multimedia concepts, audio and video with text, image, graphics and animation.

Learning Outcome

To understand the multimedia concepts and applications.
To learn digital audio and video concepts.
To gain knowledge in working with Photoshop and flash.
To learn basics of Flash
To use advanced features in Flash

Unit I

Introduction to Multimedia - products and evaluation -computer architecture standards-operating systems and software - Text - Graphics.

Unit II

Introduction to Digital audio and video –characteristics of sound and digital audio and video-digital audio systems-MIDI_audio file formats-using audio in multimedia applications.

Unit III

Introduction to Photoshop – working with Photoshop – processing the image using Photoshop techniques-layers-filter.

Unit IV

Introduction To Animation- How flash works- Flash tool box – creating objects – drawing characters for cartooning editing objects – Colors and text- symbols and instances – bitmaps.

Unit V

Flash And Layers- Animation in flash key frame animation,tweened animation - Motion tween, shape tween-guide layers- Masking-Publishing in flash- action Script.

Text book:

1. Introduction to Multimedia and its applications, V.K. Jain, 1st Edition , 2012

Reference books:

Multimedia technology and applications, Hillman, David -Galgotia publications pvt ltd-2001
Multimedia in action, Shuman,J.E -Thomson Asia pvt ltd-2001.
Multimedia communications, Halsal,fredl-Pearson education pvt ltd-2003.
Michelle Perkins, Beginner's Guide to Adobe Photoshop, Amherst Media, Inc., 2006
Andrew Rapo, Understanding Macromedia Flash 8 ActionScript 2, Focal press, 2013

Web Sites:

www.insidegraphics.com
www.entheosweb.com/Flash/motion_tween.asp

BCA 2541 Data Structure using C++ (3T+2L) 5hrs/5cr

Objective

To enable the students to understand the fundamentals of Data Structures, abstract concepts and how these concepts are used in problem solving and exposingthem to algorithmic thinking and problem solving thoroughly imparting moderate skills in program.

Learning Outcome

To identify the fundamental data structures and summarize their uses.
To handle Stack and Queue data structures
To understand and create various types of linked lists.
To create binary representation of data structure and its operations
TO handle BST and develop sorting algorithms for the search requirements.

Unit I

Introduction to Data structures: Definition- Classification of data structures: primitive and non-primitive- Operations on data structures-Dynamic memory allocation and pointers: Definition- Declaring and initializing pointers- Memory allocation functions: malloc, calloc, free and realloc-Arrays-Structures- Assumption Notation – complexity.

Unit II

Stack: Implementation-stack operations-Applications of a stack: Polish notations –Infix, Postfix and Prefix notations- Conversion of an arithmetic expression from Infix to postfix Recursion. Queue: Definition-Implementation -Types of queue simple queue, circular queue, double ended queue-operations on queue-applications of a queue.

Unit III

Linked list: Definition – Advantages and Disadvantages of linked list –Singly Linked List-Doubly linked list-circularly linked list-Doubly circular Linked List-Operations on Singly Linked List-Applications of linked list- Basic Graphs- shortest path-spanning tree-Searching.

Unit IV

Trees: Definition- Types of Trees- Binary tree: Creation of binary tree- Representation-Traversal of Binary Tree : Preorder, Inorder andPostorder-applications of tree.

Unit V

Binary Search Tree: Definition-Operations on BST-Application of BST - Sorting: Searching techniques: sequential search, Binary search –Sort: Bubble sort, Selection sort, Merge sort, insertion sort, Quick sort.

Text book:

1. Data Structures Using C++, D.S. Malik, Second Edition, 2010

Reference Books:

Data structures, A.Chitra, P.T Rajan, Tata McGraw Hill Education[India] Pvt.,Ltd 2006
Data structures with C,SeymourLipschutz,Tata McGraw Hill publishing 2011.
Data Structures Using C++ ,Varsha H. Patil,2012
Data Structures and Algorithms in C++,Joshi, Tata McGraw-Hill Education, 2010.

Web Sites:

www.cprogramming.com/algorithms-and-data-structures.html
freevideolectures.com/Course/2279/Data-Structures-And-Algorithms
discuss.codechef.com/questions/48877/data-structures-and-algorithms

BCA 2543 Dot Net Programming 5hrs/5cr

Objective

The aim of this course is to enable the studentsto gain depth knowledge and acquire skills to develop window based application and Rich Internet Web applications and also provides a deep exploration of Dot Net development philosophy and practical advice.

Learning Outcome

To understand the dot net framework and its features
To use vb.net and write programs including oops concepts
To handle exceptions and create menus in vb.net
Understanding the features of ADO.NET and handle sql commands for data manipulation
Create dynamic websites using ASP.NET.

Unit I

Introduction to Dot Net platform-advantages of Dot Net-working of Dot Net- .basic architecture of net frame work-common language run time-common language specification-unified programming classes-security in Dot Net-CLR: Meta data –assembly-MSIL-Just in Time compiler-class loader-verifier-architecture of CLR-features of CLR.

Unit II

VB.NET: Visual studio .net IDE-Programming concepts- operators – control and looping statements - arrays - writing procedures-sub procedure – function procedure – property procedure – operator procedure - OOPs in VB.net: class-object-inheritance-polymorphism-inheritance-my base class keyword-my class keyword-abstract base class

Unit III

Exception handling-working with forms-Advanced window application: basic controls and methods – advanced controls – menustrip - context menu strip – status bar – rich text box – web browser - graphical application-custom window controls. Data access using ADO.NET: Overview of ODBC-UDA-ADO.NET Component model.

Unit IV

SQL Commands –Data Definition Language – Data Manipulation Language – Data Control Language - ADO.NET object model- managed provider in ADO.net –ADO.net name spaces and classes-Connection –Command – dataadapter – dataset –data reader - error – datagridview - advantages of using ADO.net-data access using ADO-using ADO.net data form wizard.

Unit V

ASP.NET: Features of ASP.net-structure of an ASP.net page-creating simple web application-using common web control-ASP.net Objects – request – response – server – session – application – error – Master page – validation controls- ASP.net State Management – web configuration -create web application using data base connectivity-web services.

Reference books:

Professional Visual Studio 2015 (WROX) ,Wiley ,2015
Microsoft Visual Basic 2013 , Microsoft Press US ,1st edition, 2013
Mastering Microsoft Visual Basic 2010 , Sybex , 1 st edition , 2010
4. .Net Programming Black Book, Kogent Solutions Inc, Published by Dreamtech Press, New Edition, 2005.

Web Sites:

wisentechnologies.com/it-courses/.net-training.aspx
codemyne.net/articles/DotNet-framework-main-objectives.aspx
3.www.ajr2training.com/dot-net-training

BCA 2545 Data Base Management System (3T+2L) 5hrs/5cr

Objective

The aim of this course is to help the student learn the concept of data structure of a database model in detail and also extensively covers the normalization process, overview of the database systems, Relational model, SQL, Data mining and Data warehousing.

Learning Outcome

To understand the database concepts and E-R models.
To gain knowledge on various relational operations such as Join, etc.,
To understand the concept of Normalization of data using various normal forms.
To learn the concepts of data mining system
To understand the concept of data warehousing and its operations

Unit I

Introduction: Purpose of database systems - view of data - data models – database languages - transaction management - storage manager - database administrator and database users - overall system structure. E-R model: E-R diagram – constraints – keys - Extended E-R features - Relational model: structure of relational databases - the relational algebra – Extended Relational algebra operations.

Unit II

Relational commercial languages: SQL- Basic structures,joins, set operations, aggregate functions, null values - query-by-example – domain constraints, referential integrity - assertions – triggers -view– exception- cursor-procedures.

Unit III

Relational database design: First normal form - pitfalls in relational database design - functional dependencies – Decomposition - Boyce–codd normal form, third normal form, and fourth normal form – de normalization.

Unit IV

Introduction to Data mining-Types of Data – Data Mining Functionalities – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse.

Unit V

Introduction to Data WareHousing - Data warehousing Components –Building a Data warehouse – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata.

Text book:

Database System Concepts, AviSilberschatz, Henry F. Korth, S. Sudarshan, McGraw Hill, 6th Edition,2010.

Reference Books:

Database Management System Concepts, N.F.Korth and A.Silberschatz, S.Sudarshan, 4/e, McGraw Hill Inc., 2002.

An Introduction to Database Systems, B.C. Desai, Galgotia Publications, New Delhi, 1995.

Fundamentals of Database Systems, R.Elmasri and S.B. Navathe Benjamin Cummings, Redwood City, 1994.

Database Management, Gordon C.Everest, TataMcGraw-Hill, NewDelhi, 2001.

Database Principles, Programme & performance – Patrick O'Neil, Elizebeth O'Neil, A hartcourt, 2006.

Web Sites:

rdbms.ca/database/introduction.html.

www.w3schools.com/sql/sql_intro.asp.

www.cramerz.com/database_concepts/dbms_and_rdbm.

BCA 2447 Dot Net Laboratory 4hrs/4cr

Objective

To train the student to learn a programming language and learn problem solving techniques.

Learning Outcome

While completing the course, the students acquire the knowledge to build the logic and develop a solution for a problem statement.

NET (vb.net or c#) program for Feedback form

Create a DOT NET for displaying the images with clear option

Write Web Controls to display in Web form

Prepare a button-click option to display a label3.

Write mouse move over to change button color

Create list box to display the selected item cost in web form2. Create another label to display the total cost3. Write a Java script program to display a calendar 4. Write a Java Script code to display advertisements as hyperlink

Write a DOT NET program to calculate Boiling point of water using Compare Validate

Create a DOT NET program for User input name validation using Required Field Validate

Write a DOT NET program Checking the appropriate values using Validation button

Create a form to validate the controls getting user inputs

Create an application with content buffered

Creating a file holding variables, hyperlinks with lock & unlock methods

Display a message when connection established with Database
Write a Program to create a table in Master Database
Updating the fields of a table in Database
Selecting the rows from a table in Database
Retrieving the Result in Dataset & Checkbox List by selecting a field
Bind the dataset to a Radio button list with different forms
Create a Table header fields in the form of drop down list

BCA 2542 Software Engineering 5hrs/5cr

Objective:
The aim of this course is to enable the students to understand Software requirements, specification, Software design techniques for developing large software systems, Software testing, documentation and maintenance.

Learning outcome
To classify the various software process models.
To understand and work on requirement engineering
To work on analysis an d design. Understanding various modeling
To understand the software testing concept.
To know the software quality and maintenance concept.

Unit I
Software Characteristics – Introduction to Software Engineering – Factors influencing quality and productivity – Software Process CMM – PSP – TSP – Software Engineering Models – Cost Estimation – Feasibility Analysis – Software Project management.

Unit II
Requirement Engineering – Requirements - Documents – Requirements Elicitation – Requirements Analysis and Negotiation – Requirements Validation – Requirements Management.

Unit III
Analysis and Design – Information Flow Analysis – DSSD-OOA- Use Case Modeling – Class Modeling – Dynamic Modeling – Design Engineering – Creating Architectural Design – Modeling Component level design – User Interface design – Transform and Transaction Analysis – OOD.

Unit IV
Testing Principles – Testing Strategies – Unit Testing – Integration Testing – White Box Testing -Black Box Testing – OOTM – Domain Testing -Implementation.

Unit V
Software Maintenance – Issues in Maintenance – Change Management – Software Quality and Quality Assurance – Human Factors in Software Engineering – Introduction to Web Engineering, Case studies.

Text book:
Software Engineering: A Practisener Approach, Roger S Pressman, McGrawHill, 8th Edition, 2015.

Reference books:

Requirements Engineering, Ian Somerville, Johnwilley, 1998.
Object Oriented and Classical Software Engineering, Stephen R. Schach, TataMcgrawHill, 5th Edition, 2006.
A Discipline for Software Engineering,Watts S. Humphrey, Pearson Education, 2001.
Software Engineering,K.K. Agarwal and Y. Singh, revised 2nd edition, New AgeInternational Publishers, 2006.

Web Sites:

www.tutorialspoint.com/software_engineering.
www.jkinfoline.com/software-engineering.html.
www.wiziq.com/tutorials/software-engineering.

BCA 2544 Computer graphics (3T+2L) 5hrs / 5cr

Objective

The aim of this course is to enable the students to learn the basic principles and techniques of graphics, applications and to implement graphics program using two dimensional and three dimensional concepts.

Learning Outcome

To understand the graphics, design and the primitives
To learn the basic principles and techniques of graphics.
To gain knowledge in working with graphics program using 2D and 3D concepts.
To learn about transformations, clipping and projections
To understand ray tracing process and apply on case studies.

Unit I

Overview of computer graphics – Display devices – Output Primitives – Points and Lines – Line drawing algorithms – Circles and ellipse generating algorithm- Other Curves.

Unit II

Introduction to attributes - Attributes of output primitives- line – curve – area – character attributes - Color filling – filled area primitives – fill area functions - Character Generation.

Unit III

Introduction to Transformations-2D affine Transformations-Two-Dimensional Transformation-Transformation-Matrix representation and homogeneous co-ordinates

Unit IV

3 D Concepts – 3 D co-ordinates systems – 3D display techniques – 3D transformations – 3D viewing – Windowing and Clipping – Projection

Unit V

Introduction to Ray Tracing-Ray tracing process-Ray tracer Application-Antialiasing Ray Tracing-reflections and transparency- case studies.

Text book:

1. Computer Graphics, Rajiv Chopra, S. Chand, 4th edition, 2011.

Reference books:

Computer Graphics, Donald Hearl, Pauline Baker M., Prentice Hall of India, New Delhi, 2nd edition, 2005.
William Newman, Sproul F, Principles of Interactive Computer Graphics Prentice Hall of India,2003.
John F Koegel Buford – Multimedia Systems – Pearson Education 2001.
Computer Graphics, ShaliniGovil-Pai, Springer (India) Private Limited, 2007.

Web Sites:

www.4twk.com/shill/3rd-edition.html.
www.tutorialspoint.com/computer_graphics.
www.inf.ed.ac.uk/teaching/courses/cg/Web/intro_graphics.pdf.
www.coursera.org/learn/interactive-computer-graphics.

BCA 2546 Java Programming 5hrs/5cr

Objective

The Objective of this course is to introduce the programming techniques in Java, java applet, awt, multithreading, iostreams, database connectivity and swing components also to enrich the creativity of GUI applications using java.

Learning Outcome

To gain knowledge of the structure and model of the Java programming language.
To use the Java programming language for various programming technologies.
To understand Java IO Streams and using thread concept.
To propose the use of certain technologies by implementing them in the Java programming language to solve the given problem.
To understand awt concept, applets and java swing.

Unit I

Java Fundamentals -Features of Java-OOPs concepts-Java virtual machine-Reflection byte codes -Byte code interpretation-Data types, variable, arrays, expressions, operators, and control structures Objects and classes.

Unit II

Java Classes-Abstract classes-Static classes-Inner classes-Packages-Wrapper classes-Interfaces-This –Super-Access control - Exception handling - Exception as objects-Exception hierarchy- Try catch finally- Throw, throws.

Unit III

IO package -Input streams-Output streams-Object serialization-Deserialization-Sample programs on IO files-Filter and pipe streams - Multi threading- Thread Life cycle-Multi threading advantages and issues-Simple thread program-Thread synchronization-Inter Thread Communication.

Unit IV

GUI-Introduction to AWT programming -Layout and component managers-Event handling-Applet class- Applet life-cycle-Passing parameters embedding in HTML.

Unit V

Swing components – JApplet, JButton, JFrame, etc.Database Connectivity-JDBC architecture-Establishing connectivity and working with connection Interface-Working with statements-Creating and executing SQL statements-Working with Result Set.

Text book:

Programming with Java A Primer, E. Balaguruswamy Tata McGraw Hill,5th Edition , 2017

Reference books:

Java - The Complete Reference ,Herbert Schildt , McGraw Hill Education; Tenth edition,2017

Core Java: An Integrated Approach, New: Includes All Versions upto Java 8 ,R. NageswaraRao,Dreamtech Press ,2016

Java Programming: A Beginners Guide to Learning Java, Troy Dimes, Create Space Independent Publishing Platform,2015.

Web Sites:

www.tutorialspoint.com/javaexamples.

www.vogella.com/tutorials/JavaIntroduction/article.html.

www.udemy.com/java-tutorial.

BCA 2448 Java Laboratory 4hrs/4cr

Objective

To train the student to learn a programming language and learn problem solving techniques.

Learning Outcome

While completing the course, the students acquire the knowledge to build the logic and develop a solution for a problem statement.

Programs using constructor and destructor.

Creation of classes and use of different types of functions.

Count the number of objects created for a class using static member function.

Concept of interface.

Concept of package.

Function overloading.

Concept of inheritance.

IO streams & Files.

Exception handling mechanism.

AWT

Swing.

Event handling.

JDBC.

BCA 3641 Computer Networks 6hrs/6cr

Objective

The aim of this course is to impart a basic understanding of how computers communicate using different devices and protocols.

Learning Outcome

To gain knowledge about networks, internal components and its functionality.
To understand about layers of OSI and TCP/ IP protocols and its process.
To understand IP datagrams, address and Protocol mapping
To gain advantage of the transport layer
To understand real time application examples of networking such as email, DNS, File transfer.

UnitI

Network Fundamentals: Uses of Computer networks Transmission Media - Classification of Networks - Network Topology - Transmission technology-Transmission Modes – Network models- OSI Reference model –TCP / IP model.

Unit II

Physical layer: Data and Signals- Data Encoding – Multiplexing and Switching- Data link layer – Data link control- Error detection and correction – Block coding - wired LANs- Wireless LANs – IEEE 802.11 – Bluetooth-Wireless WANs.

Unit III

Network Layer: IP Datagrams- IP address- IPV4 Addresses – IPV6 Addresses - Internet Protocol- Address Mapping - ICMP- IGMP – Delivery, Forwarding and Routing.

Unit IV

Transport Layer: Process to Process delivery - Connection establishment -User Datagram Protocol –Transmission control protocol -Congestion Control – Flow Control.

Unit V

Application Layer – Domain Name System Remote Logging, Electronic Mail and File Transfer- WWW and HTTP-Network Management: SNMP – Multimedia.

Text book:

1. Computer Networks Hardcover, Andrew S. Tanenbaum , David J.Wetherall 2010.

Reference books:

1. Data communication and Networking, Behrouz A Forouzan, 2nd Edition 2014.
2. Computer Networks, 5th Edition, A Systems Approach, Peterson & Davie, 2011
Computer Networking: Principles, Protocols and Practice Release 0.25,
Olivier Bonaventure, the Saylor Foundation, 2011.
Internetworking with TCP/IP Volume One, 6/E, Douglas E. Comer, 2014.

Web Sites:

www.elsevier.com /Browse journals/Computer Networks
en.wikipedia.org/wiki/Computer_network
www.techtutorials.net

BCA 3643 Python Programming (4T+2L) 6hrs/6cr

Objective

The aim of this course is to enable the students to learn program and concepts acquiring programming skills in python. Itcovers expressions, variables, functions, logic, and conditionals, which are foundational concepts, File Handling and Regular Expressions.

Learning Outcome

To understand why Python is a useful scripting language for developers.
To gain knowledge of the basics of python programming such as datatypes, variables, control statements.
To handle functions in Python Language
To learn how to use files in Python applications.
To learn how to implement oops concepts and GUI programming.

Unit I

History of Python–Features of Python – working with Python – Basic Syntax – input / output functions - Variables and data types – operators- conditional and control statements – looping statements.

Unit II

String Manipulations – Access Strings – Basic Strings – String Slices – Functions and Methods-List,Tuples, Dictionaries – Operations – working with list- functions and methods.

Unit III

User Defined function – defining function-calling function-types of functions – arguments – anonymous functions – global and local variables- modules- importing module -Math module - Random module - Packages - Composition

Unit IV

File handling - Opening and closing file -Reading and writing files – file handling functions - Exception Handling - Except clause -Try finally clause -User Defined Exceptions

Unit V

Oops concept - class and object – attributes – Inheritance – Overloading – Overriding – Data hiding - Regular expressions-Match function-Search function - Matching VS Searching – Database – GUI Programming

Text Book:

1. Introduction to Computing and Problem Solving Using Python, Balagurusamy,McGraw Hill Education India Private Limited; First edition ,2017

Reference books:

Think Python: How to Think Like a Computer Scientist, Allen B. Downey, Updated for Python 3, Shroff/O'Reilly Publishers,2nd edition, 2016.
Core Python Programming , R. NageswaraRao ,Dreamtech Press,2016
An Introduction to Python – Revised and updated for Python 3.2, Guido van Rossum and Fred L. Drake Jr, Network Theory Ltd., 2011

Websites:

www.learnpython.org
www.codecademy.com/learn/learn-python

BCA 3645 Internet Technology 6hrs/6cr

Objective

This course will make the students to understand surfing the web and trying to figure out how specific functionality is brought to a website and molds the student to learn and develop various PHP technology applications which definitely will meet the current industry need.

Learning Outcome

To analyse a web page and identify its elements and attributes.
To select and apply mark-up languages for processing, identifying and presenting, also to use scripting languages to add interactive components to web pages.
To gain knowledge on JSON and PHP basics
To handle mysql database using PHP programs.
To understand and use XML syntax, attributes etc.,

Unit I

Introduction to HTML - Basic tags- Formatting: images, lists, Tables, Frames, Links, Form. Styling with Classes- Styling with IDs.CSS - The Presentation Semantics- CSS Properties- Types of Style Sheets

Unit II

JavaScript with HTML- Variables, Operators, Expressions, Arrays - Handling Loops & Decision structures - Understanding jQuery-Selectors- Event Manipulation Methods- Sliding, Easing, Fading, Toggling - jQuery and AJAX calls.

Unit III

Introduction to JSON- Overview of PHP –Data types –Variables –Expressions –control and Structure – functions –classes and objects –arrays –simple and multiple Dimensional arrays.

Unit IV

Using Mysql in PHP- Connection to a Data base – Listing DB –Displaying DB Tables – inserting a row of data using forms in PHP – Using Images –Mail management – File management.

Unit V

Introduction to XML – How to use XML –XML syntax –XML elements- XML attributes – Displaying XML Files – Working with XSL –Web Application Development using WordPress - Working with Code Igniter Framework.

Text book:

Web Technologies--A Computer Science Perspective, Jeffrey C. Jackson, Pearson Education, 2011.

Reference books:

Web design with HTML, CSS, JavaScript and jQuery set, John Duckett, Wiley, 2014.

HTML Complete reference,Powell A.T., TataMcgrawHillPublications , 3rd edition(2000).

The complete Reference Java Script,PowellA.T.TataMcgrawHill Publications 2nd edition,2004.

PHP and MySql web Development, Luke Welling, Laura Thomson, 5th edition, publisher: addison – Wesley professional, 2016.

HTML, XHTML and CSS Bible, Steven M.Schafer, 5th edition, Wiley –Eastern publishing Inc., 2011.

BCA 3547 Internet Technology Laboratory 5hrs/5cr

Objective

To make the student learn a programming language and learn problem solving techniques.

Learning Outcome

While completing the course, the students acquire the knowledge to build the logic and develop a solution for a problem statement.

HTML Basic Tags.
Example for Table Tag.
HTML Formatting Tags.
HTML Frame.
HTML Input Tags.
Image Map.
Style Sheet-XSL,CSS.
Form Validation.
MYSQL Commands (DDL, DML, TCL, DCL).
PHP Program with Data base Connectivity.
Cookies.
Session Object.
Error Object.
XML

BCA 3200 Environmental Studies 3hrs/2cr

Objective

The aim of this course to gain knowledge about environmental issues and to create awareness of environment and pollution to students.The various aspects of environment like ecosystem, biodiversity, pollution and e-waste.

Learning Outcome

To understand about environmental system its issues and awareness.
To learn about ecosystem, biodiversity, pollution.
To gain knowledge about energy sources
To understand different types of pollution and how to avoid
To know what is e-waste and how to manage it.

Unit I

Introduction – Terms and Definitions – Scope and history of Ecology - Ecosystem – Types and functions of structural components (i) A-biotic-atmosphere-lithosphere-hydrosphere – light and temperature (ii) Biotic-Organisms –tropic levels – and interactions among organisms -food chains – food-web-ecological pyramids and energy flow.

Unit II

Bio diversity: definition –genetics-species and ecosystem diversity-biodiversity at global national and local levels- conversation methods (in situ and ex situ)-patents-bio safety protocol- Role of technology in environmental protection.

Unit III

Energy sources: renewable and non-renewable energy sources. Renewable: energy from biomass-gobar glass plant-solar-wind-water-tidal energy. On-renewable energy: fossil fuels-coal-crude oil and natural gas-oil (shale –tar –sands)-nuclear energy-geothermal energy ocean thermal energy-bio fuels.

Unit IV

Environmental surveillance: pollution types -air pollution: global warming-ozone hole – smog and CFC –water pollution: BOD-COD-eutrophication-thermal pollution -noise pollution-nuclear pollution- sources of radiation- solid waste pollution- pollution control-water treatment and waste management - remote sensing.

Unit V

e-waste – toxic constituents – pollution problems – health impact of hazardous waste – reuse and recycling – collection process - separation process - e-waste recycling act – e-waste policy for India – Computer uses and impact on Health

Text book:

1. Environmental Studies from crisis to cure, R. Rajagopalan, 3rd edition, 2015.

Reference books:

Environmental bio technology- industrial pollution management Enger, ED and ROSS, Tata McGraw hill Publishing, 2000.

Essentials of ecology and environmental sciences, Jogdand.N, Himalaya publishing house, Bombay, Rana, SVS Prentice Hall of India Pvt.Ltd, 2003.

Enger, ED and ROSS, concepts in biology, Tata McGraw hill Publishing, 2000.

Environmental bio technology- industrial pollution management,Jogdand. N, Himalaya publishing house, Bombay, 2000.

BCA 3243 Cyber Security (4T+2L) 3hrs/2cr

Objective

The aim of the course is to familiarize students with the basic problems of information systems security, various categories and kinds of cyber-crimes. It includes the risks of information systems in the context of confidentiality, integrity and availability of information security policy development and issues system.

Learning Outcome

To evaluate the computer network and information security needs of an organization

To understand information systems security, various categories and kinds of cyber-crimes

To gain knowledge on cyber terrorism and the challenges in our nation

To access cyber security risk management policies

To understand what is IPR, its need and how it will help in cyber security.

Unit I

History of Internet -Internet Addresses - DNS - Internet Infrastructure - World Wide Web - Classification of Cyber Crimes - Reasons for Commission of Cyber Crimes Management of Cyber security Risks, Threats – Vulnerabilities – Impacts, Federal Role - Federal Spending Legislative Proposals and Actions

Unit II

Cyber-attacks: the evolution of modern warfare - malware And Its Type - Kinds of Cyber Crime - Authentication - Encryption - Digital Signatures - Antivirus - Firewall - Steganography - Computer Forensics

Unit III

Cyber terrorism – Method of attack – tools for Terrorism – Challenges to India's National security – existing cyber security initiatives - challenges and concerns

Unit IV

Cyber security in India present status – national cyber security policy – Indian cyber space – private public partnership – R & D in the field of Cyber Security.

Unit V

Intellectual property issue areas – cyber law issue – practice settings – career narratives – preparing for a career in Intellectual property or cyber law – fellowship & other Opportunities.

Text Book:

AvantikaYadav, "Cyber Security", Narosa publishing House Pvt., Ltd., New Delhi, 2017

Reference books:

Introduction to Cyber Security, JeetendraPande, Dr. JeetendraPande, Assistant Professor- School of CS & IT, Uttarakhand Open University, Haldwani, 2015

Cyber security Issues and Challenges: In Brief Eric A. Fischer Senior Specialist in Science and Technology August 12, 2016.

Intellectual property and cyberlaw, Joan Ruttenberg, 2013

James Graham, Cyber Security Essentials, Taylor and Francis Group, LLC, 2011

Websites:

www.tutorialspoint.com/information_security_cyber_law/information_security_cyber_law_tutorial.pdf

BCA 3645 Big Data Analytics (4T+2L) 6hrs/6cr

Objective

This course Big Data Analytics largely involves collecting data from different sources, Optimize business decisions and create competitive advantage with Big Data analytics, Preparing for data summarization, query, and analysis. Applying data modeling techniques to large data sets, creating applications for Big Data analytics, Building a complete business data analytic solution.

Learning Outcome

To demonstrate knowledge of big data analytics.
To think critically in making decisions based on data and deep analytics.
To understand the tool R Language for handling Big data
To use technical skills in R for predicative and prescriptive modelling.
To use various graphic tools for data representation.

Unit I

Introduction to Big Data Analytics- Overview - State of the Practice in Analytics - Data Analytics Lifecycle – Discovery - Data Preparation - Model Planning - Model Building.– Communicate results – Operationalize.

Unit II

Big Data Analytics – Problem definition – Data Collection – Cleansing Data – Summarizing Data – Data Exploration – Data Visualization, Sources of Big Data , Big Data Analytics Tools - open source big data analysis tools –

Unit III

Introduction to R- R Graphical User Interface – Features of R – Basic Syntax – data types – variables – Operators - Decision Making – Loops – Function - Strings

Unit IV

R Vectors – Lists – Matrices – Arrays – Factors – Data Frames, Importing csv files, Excel files, Binary files, xml file

UnitV

An Introduction to Graphics - Basic Plotting Tools - Plot Function, par Function, Pie Chart ,Bar Chart, Box plots, Histograms, Line Graphs, Scatter plots.

Text Book:

1. Big Data and Analytics, SeemaAcharya, Wiley India Pvt.Ltc. New Delhi, 2015

Reference Books:

DT Editorial Services, “Black Book- Big Data (Covers Hadoop 2, MapReduce, Hive, Yarn, PIG, R, Data visualization)”, Dream tech Press edition 2016.
Data Science & Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data Published by John Wiley & Sons, Inc.2015.
Garrett Grolemund, Hands – On Programming with R, O’Reilly Media Inc., 2014
SudhaG.Purohit, “Statistics using R”, Narosa publishing House Pvt., Ltd., New Delhi, 2015

Web Sites:

www.tutorialspoint.com/big_data_analytics/index.htm
www.tutorialspoint.com/r/r_tutorial.pdf
pig.apache.org/docs/r0.7.0/tutorial.html

BCA 3644 Fundamentals of Linux (4T+2L) 6hrs/6cr

Objective

The main objective of this course is to provide Students a comprehensive overview of the Linux operating system along with Shell commands and shell scripting, Implementation of Linux System programs through GCC compiler, Understanding of basic concept of Socket programming (TCP and UDP).

Learning Outcome

To understand about features and administration of Linux.
To understand Linux desktop KDE.
To learn the Linux commands, shell scripts, multimedia in Linux and open Office.
To gain knowledge about resource management amd networking in Linux.
To use GTK tools and awk programming.

Unit I

Linux – The Operating System: Linux history, Linux features, Linux distributions, Linux's relationship to UNIX, Overview of Linux architecture, Installation, Startup scripts, system processes - Linux Security - File systems: General Characteristics of File system, file permissions. User Management: Types of users, The powers of Root, managing users (adding and deleting): using the command line & GUI tools.

Unit II

Getting started with the desktop-logging in to linux getting familiar with the desktop-using the KDE desktop -using linux commands-the shell interface-understanding the linuxshell – using the shell in linux –working with the linux file system.

Unit III

Accessing and publishing in linux –finding common application in linux – other word processors –working with graphics -Multimedia in linux –Tools for using internet and the web –browsing the web –instant messaging with gain.

Unit IV

Resource Management in Linux: file and directory management, system calls for files Process Management, Signals, IPC: Pipes, FIFOs, System V IPC, Message Queues, system calls for processes, Memory Management, library and system calls for memory. Red hat package manager, RPM commands.

Unit V

Introduction to GTK – tools – commands – GTK basic programming – awk programming - Networking in LINUX: Socket Introduction, Elementary TCP Sockets (Socket Function, Connect Function, Bind, Listen, Accept, Fork and Exec), TCP Client server Example, Elementary UDP Sockets.

Text Book:

1. Linux Bible, Christopher Negus, 9th Edition,2015.

Reference books:

Linux Programming by Examples of the Fundamentals, Arnold Robbins, Pearson Education, 2nd Edition, 2008.

Red Hat Linux Administrator's Guide, Cox K, PHI, 2009.

UNIX Network Programming, R. Stevens, PHI, 3rd Edition, 2008.

Beginning Linux Programming, Neil Mathew & Richard Stones, Wiley Dreamtech India,4th Edition,2008.

Web Sites:

www.linuxtopia.org

www.advancedlinuxprogramming.com

how-to.linuxcareer.com/c-development-on-linux-introduction.

BCA 3646 Fundamentals of mobile computing (4T+2L)6hrs/6cr

Objective

The aim of this course is to understand the theory as well as practical knowledge of mobile computing using android.

Learning Outcome

To learn the basic concepts of mobile communications and the devices
To build understand the architecture and the features of android OS.
To create applications using android
To understand layout and managing layouts
To gain knowledge on the various views

Unit I

Introduction to mobile computing – wireless transmission – signals – antennas –cellular wireless networks - Devices: Information Access Devices – Smart Identification – Smart Cards, Labels, Tokens, Smart Sensors and Actuators – Smart Appliances and Home Networking.

Unit II

Introduction to mobile generations -Android-Android architecture -Features -Applications - Versions -Flavors-Building the project.

Unit III

User Interface Architecture -Activity life cycle - Intents – Services – Content providers - UI Widgets – Text controls –Button controls – Toggle buttons – Menus – Options menu – Context menu – popup menu.

Unit IV

Layout manager – Relative layout – Linear layout - Table layout – Grid layout – Adaptor – Array adaptor – ArrayList adaptor – Base adaptor – Lists.

Unit V

View – Grid view – Web view – Scroll view – Search view – Dynamic list view – Expanded list view – Working with data storage – Shared preferences – Preferences activity – Files access – database connectivity using SQLite.

Text book:

1. Learning Android, Marko Gargenta, Masumi Nakamura, O'Reilly, 2nd edition, 2014.

Reference books:

Principles of Mobile Computing, UweHansmann, LotharMerk, Martin S.Nicklous and Thomas Stober , Springer Professional Computing, 2nd Edition, 2008.
Mobile Computing Theory and Practice, KumKumGarg, Pearson Education, illustrated edition, 2010.
Mobile Computing and Wireless Communications, Amjad Umar, NGE Solutions, 2004.

Web Sites:

www.edunotes.in/mobile-computing
www.tutorialspoint.com/android.
www.javapoint.com/android.

BCA 3548 Project 5hrs/5cr

Objective
The aim of this course is to encourage the students to develop a Real Time Application for client with the guidance of internal and external faculty.

Learning Outcome
The student experiences and learns the company software technology and methodologies.

Evaluation Pattern:
Internal (3 Presentations) - 75 marks
External (Final Presentation and Viva Voce) - 25 marks

BCA 3244 Advanced Excel (2T+1L) 3hrs/2cr

Objective
UponSuccessful completion of this course students will be able to use advanced graphs and presentation techniques to maximize impact, use macros and VBA automate your spreadsheets and increase interactivity, Using PivotTables and Power Pivots to turn raw data into clear information that supports key decisions.

Learning Outcome
To identify the different components of the Excel worksheet.
To differentiate between an Excel workbook & worksheet.
To construct formulas, including the use of built-in functions, and relative and absolute references.
To create and modify charts also to create macros in excel.
To understand the various ways of customization in excel.

Unit I
Introduction to Excel - Formulas with Multiple Operators - Inserting and Editing a Function Auto Calculate and Manual – Calculation - Defining Names - Using and Managing Defined Names - Displaying and Tracing Formulas – Database Functions - Using Lookup Functions (VLOOKUP) - User Defined and Compatibility Functions – Financial - Date & Time - Math & Trig - Statistical.

Unit II
Sorting by One Column, Colors or Icons - Multiple Columns - a Custom List - Filtering Data - Creating a Custom AutoFilter - Using an Advanced Filter - Creating a PivotTable - Specifying PivotTable Data Changing a PivotTable's Calculation - Filtering and Sorting a PivotTable - Working with PivotTable Layout - Updating a PivotTable - Formatting a PivotTable - Creating a PivotChart.

Unit III
Working with Data Tables - Using Goal Seek – Text to Columns - Grouping and Outlining Data - Using Subtotals - Consolidating Data by Position or Category - Consolidating Data Using Formulas - Working with the Web and External Data - Inserting a Hyperlink - Importing Data from an Access Database or Text File - Importing Data from the Web and Other Sources.

Unit IV

Working with Macros - Recording a Macro - Playing and Deleting a Macro - Adding a Macro to the Quick Access Toolbar - Editing a Macro's Visual Basic Code - Inserting Copied Code in a Macro - Declaring Variables and Adding Remarks to VBA Code - Prompting for User Input - Using the If…Then…Else Statement.

Unit V

Customizing the Ribbon - Customizing the Quick Access Toolbar - Using and Customizing AutoCorrect - Changing Excel's Default Options - Creating a Custom AutoFill List - Creating a Custom Number Format.

Text book:

1. Excel 2013 Bible, Walkenbach, Illustrated, John Wiley & Sons, 2013

Reference Books:

Excel 2013 Formulas, Walkenbach, John Wiley sons, 2013
Business Math Using Excel, Sharon Burton, Nelda Shelton, Cengage Learning, 2011.
Excel Dashboards and Reports, Michael Alexander, Walkenbach, John Wiley & sons, 2013
Advanced Regression in Excel – The Excel Statistical Master, Mark Harmon, 2011.

Web Sites:

chandoo.org/wp/excel-basics
www.gcflearnfree.org
support.office.com/.../Excel-2013-training-courses.

UNDERGRADUATE DEPARTMENT OF COMPUTER APPLICATIONS

Value Added Courses

W.e.f. 2020-2021

Semester	Course Code	Course Title	Hrs	Credit
I	BCA 121V	Graphics design with CorelDraw	2	2
III	BCA 22IV	Content Management System using WordPress	2	2
V	BCA 32IV	Data Visualization with Tableau	2	2

BCA 121V **Graphics design with CorelDraw** **2hrs/2cr**

This course aims to enabling the students to learn the concept of CorelDraw, to gain immense knowledge of CorelDraw. Students learn to create vector art and illustrations for logos, web graphics, brochures, and more.

Upon the successful completion of the course, students will be able to

i. Recognize the basics of CorelDraw

ii. Understanding the workspace and its various tools
iii. Designing various kinds of logos ,brochures and flyers by using special effects
iv. Illustrate the concepts of importing tables and adding images
v. Creating web graphics using bitmap

Unit 1: Introduction **6 hrs**

CorelDraw basics – Start and open drawings – scan images, work with multiple drawings, undo redo, and repeat actions, zoom, pan and scroll, preview, drawings, viewing modes, views save drawings.

Unit 2: CorelDraw Environment **7 hrs**

CorelDraw workspace tour – Application window – standard toolbar – toolbox – property bar – Dockers – Status bar, Line Shapes, and Outlines – Object, Symbols and Layers

Unit 3: 3D Effects **5 hrs**

Special effects – Lenses – Add 3D effects – Mosaics – Text – Format text – Manage Fonts - Writing tools – Templates and styles – Color styles

Unit 4: Working with Tables **6 hrs**

Tables – Add tables – Select, move and navigate table components, insert and delete table rows and columns, resize table cell, rows and columns, format tables and cells, text in tables, convert tables to text, merge and split tables and cells, manipulate tables as objects, add images, graphics and backgrounds to tables- import tables.

Unit 5: Working with Bitmaps **6 hrs**

Work with bitmaps – Special effects categories – Bitmap color modes, Trace, Printing, Web graphics, File formats

Textbook

1. "CorelDraw 2020 user guide", Corel Corporation, 2020

References

1. CorelDRAW Graphics Suite 2019 Quick Start Guide
2. https://www.entheosweb.com/tutorials/coreldraw/default.asp
3. https://www.insidegraphics.com/category/coreldraw-tools/

Mapping Course Outcome with Bloom's Taxonomy

Bloom's Taxonomy	K1	K2	K3	K4	K5	K6
CO1	**1**					
CO2		**2**				
CO3						**6**
CO4		**2**				
CO5						**6**

Mean=3.4

BCA 221V Content Management System using WordPress 2hrs/2cr

This course aims to develop the skills of the students, for maintaining and developing websites and blog.

Upon successful completion of the course, students will be able to

i. Understand the CMS concept and its tool WordPress
ii. Design a blog using CMS tool WordPress
iii. Illustrating the Blog's media Library
iv. Apply the theme and widget in Blog
v. Classify the WordPress Plug-ins

Unit 1: Content Management System 6 hrs

Introduction – Content Management System – WordPresstool - Getting Started - Installing the WordPress Software on your Web Server - Prepare the WordPress - Configuration file - Loading the WordPress Files to Your Web Server - Configuring the FTP.

Unit 2: Creating Blog using WordPress 7 hrs

Managing Users in WordPress Adding New Users to WordPress - User Roles in WordPress Deleting a User Account - Creating Categories for your Blog - Creating "Static" Pages in WordPress Configure the WordPress - Publishing Blog Posts in WordPress Accessing the WordPress Post – Menu - Writing a Blog Post in WordPress Editing an Existing Post - Deleting Existing – Posts - Writing a Blog Post in WordPress Entering Your Post Information Entering the Post Content Using the HTML View to Edit your Post

Unit 3: Working with Media 5 hrs

Inserting Media into Your Posts - Inserting Images into Posts - Inserting Media from your Computer Feature Images - Inserting a Link to Media on Other Web Sites Inserting Media from your Blog's Media Library

Unit 4:Blog Using Themes 6 hrs

Controlling the Look of a WordPress Blog Using Themes - Working With Themes in the WordPress Dashboard - Previewing a WordPress Theme -Installing a New Theme - Manually Adding Themes to WordPress - Finding High Quality Themes on the Internet - Add Content to Areas of your Blog using Widgets - Adding Widgets to Your Site Removing Widgets from the Sidebar and Footer

Unit 5: Plug-ins 6hrs

Managing WordPress Plug-ins Activating Plug-ins - Deactivating Plug-ins Adding Plug-ins to Your Site Adding Plug-ins from the WordPress Plug-ins Directory - Adding Multiple Plug-ins using FTP Software - Removing Unwanted Plug-ins - Posting to WordPress Using Desktop Software

Textbook

1. Neil Staib, “A Step by step guide on WP”, 2017

References

1. Christopher Masiello,”Wordpress: From Beginner to Expert”, Kindle Edition, 2011
2. Sarah McHarry, “WrodPress to Go”, 2013
3. https://www.wp101.com
4. https://www.hostinger.in/tutorials/wordpress/

Mapping Course Outcome with Bloom’s Taxonomy

Bloom’s Taxonomy	K1	K2	K3	K4	K5	K6
CO1		**2**				
CO2						**6**
CO3		**2**				
CO4			**3**			
CO5		**2**				

Mean = 3.0

BCA 321V **Data Visualization with Tableau** **2hrs/2cr**

This course aims to enable students to learn how to become a master at communicating business-relevant implications efficiently using data visualizations in Tableau, the most popular visualization program in the business world. Data visualization and predictive analytics is a norm in every industry today.

Upon successful completion of the course, students will be able to:

i. Understand data visualization
ii. Connect to various data sources
iii. Create complex calculations, share and publish visualizations
iv. Apply the filtering and groups
v. Build a variety of basic charts

Unit 1: Introduction **6 hrs**

Introducing Visualization and Tableau - data visualization - expectations for a data visualization tool - reasons to make a switch to Tableau - positioning of Tableau - Tableau product line - file types in Tableau Tableau Workbook (twb) - Tableau Packaged Workbook (twbx) Tableau Data Source (tds) file - Tableau Packaged Data Source (tdsx) file

Unit 2: Connecting with Tableau **7hrs**

Working with Single and Multiple Data Sources Desktop architecture - Data layer - Data connectors - Tableau environment To open – To close - Start page - Data Source Page Workspace - Workbooks and Sheets Visual Cues and Icons in Tableau - Connect to a File - Connect to a Text File - Connect to MS Access, R, MySQL, NoSQL Databases- Joins Adding Fields to the Data Pane - Exploring different types of Join Union

Unit 3: Function in Tableau **5hrs**

Table Calculations - Profitability as Percent of Total - Moving average - Types of moving average - Rank - LOD (Level of Detail) - Percentile -Number functions - String functions - Logical Functions - Date functions

Unit 4: Filtering and Groups **6hrs**

Simplifying and Sorting Your Data Filtering – filtering - Sorting - Discrete and Continuous Data - Groups - create a group - editing an existing group - creating hierarchies sets Contents - Difference between a Set and Group - Group Set Creating parameters

Unit 5: Statistics and Charts **6hrs**

Statistics - Number Summary - Spread of data - Box Plot - Pie Chart - Line Graph - Scatter Plot – Histogram - Word Cloud - Waterfall Charts - Bump Charts - Bullet Graph

Textbook

1. Joshua N.Milligan, “Learning Tableau 2019”, Packt Publishing, 2019

References

1. SeemaAcharya, SubhashiniChellappan, “Pro Tableau”, A step by step guide, APress 2017.
2. Daniel G.Murray, with the InterWorks team “Tableau Your Data”, Wiley, 2013
3. https://www.tutorialspoint.com/tableau/tableau_quick_guide.htm
4. https://www.javatpoint.com/tableau
5. https://intellipaat.com/blog/tutorial/tableau-tutorial/introduction-tableau

BCA 6

Mapping Course Outcome with Bloom's Taxonomy

Bloom's Taxonomy	K1	K2	K3	K4	K5	K6
CO1	**1**					
CO2		**2**				
CO3			**3**			
CO4					**5**	
CO5				**4**		

Mean = 3