

BA Computer Applications (OPTIONAL) (w.e.f. 2017-18 and onwards)							
Subject Code	Subject Title	Teaching Scheme Hrs/week		Exam. Duration (Hrs)	Examination Marks		
		Theory	Practical		Theory/ Practical	IA	Total
Semester I (w.e.f. 2017-18 and onwards)							
17BACA1.1	Computer Fundamentals	4	--	3	80	20	100
17BACA1.2	Computer Laboratory-MS Word Power Point	--	4	4	40	10	50
Semester II (w.e.f. 2017-18 and onwards)							
17BACA2.1	Spreadsheets and Database System tools	4	--	3	80	20	100
17BACA2.2	Computer Laboratory-MS Excel and MS-Access	--	4	4	40	10	50
Semester III (w.e.f. 2018-19 and onwards)							
17BACA3.1	Computing Fundamentals and Programming in C	4	--	3	80	20	100
17BACA3.2	Computer Laboratory-C programming	--	4	4	40	10	50
Semester IV (w.e.f. 2018-19 and onwards)							
17BACA4.1	Fundamentals of the Internet and Web Programming	4	--	3	80	20	100
17BACA4.2	Computer Laboratory-Internet and HTML Lab.	--	4	4	40	10	50
Semester V (w.e.f. 2019-20 and onwards)							
17BACA5.1	Object Orientated Programming using C++	4	--	3	80	20	100
17BACA5.2	Computer Laboratory-Programming in C++	--	4	4	40	10	50
17BACA5.3	Windows Programming	4	--	3	80	20	100
17BACA5.4	Computer Laboratory-Programming in VB	--	4	4	40	10	50
Semester VI (w.e.f. 2019-20 and onwards)							
17BACA6.1	Multimedia and Animation	4	--	3	80	20	100
17BACA6.2	Computer Laboratory-Animation Lab.	--	4	4	40	10	50
17BACA6.3	Introduction To Information Security	4	--	3	80	20	100
17BACA6.4	Computer Laboratory-Project-Application development	--	4	4	40	10	50

BACA-5.1: Object Oriented Programming using C++ Teaching Hours: 4 Hrs/week	Marks: Main Exam: 80 IA: 20
---	--

UNIT I 08Hrs
 Object oriented programming paradigm, basic concepts of OOP, benefits of OOP, object oriented languages.
 A simple C++ program, structure of C++ program, creating, compiling and executing C++ program.
 Tokens, expressions and control structures, functions in C++.

UNIT II 12Hrs
 Classes and Objects: Class specification, Member function definition – nested member function, access qualifiers, static data members and, member functions. Instance creation - Array of objects - Dynamic objects - Static Objects – Objects as arguments -Returning objects Constructors and Destructors: Constructors- Parameterized constructors, Overloaded Constructors, Constructors with default arguments, copy constructors, Destructors.

UNIT III 12Hrs
 Operator Overloading: Operator function-overloading unary and binary operators, overloading the operator using Friend function, Stream operator overloading, Data conversion.
 Inheritance: Defining derived classes. Single Inheritance - Protected data with private inheritance - Multiple Inheritances - Multi Level Inheritance - Hierarchical Inheritance. Hybrid Inheritance - Multi path Inheritance - Constructors in derived and base Class -Template in Inheritance - Abstract classes - Virtual function and Dynamic polymorphism. - Virtual destructor - Nested Classes

UNIT IV 10Hrs
 Functions in C++: Virtual functions- need for Virtual function, , Pure Virtual functions, Generic Programming with Templates. Introduction, function templates, overloaded function templates, user defined templates arguments, class templates, Inheritance of class templates.

UNIT V 08Hrs
 Files: file stream, file pointer and manipulation, file open and close, sequential and random access. Exception Handling: Principle of Exception handling, Exception handling mechanism, Multiple catch, Nested try, re-throwing the Exception.

References

1. E Balguruswamy, Object oriented programming with C++, 6th Edition, MC Graw Hill.
2. Gopalan, Siveselvan, Mala, Object Oriented Programming Using C++, PHI
3. Jana, Debasish, C++ and Object Oriented Programming Paradigm, 3rd Edition, PHI
4. Herbert shieldt, The complete reference C ++, Tata McGraw Hill.
5. Bjarne Stroustrup, The C++ programming language, Addison Wesley
6. Stephen Prata, C++ Primer Plus, 6th Edition, Addison Wesley

BACA-5.2: Computer Laboratory- Programming in C++ Practical Hours: 4 Hrs/week	Marks: Main exam: 40 IA: 10
--	--

1. Write a c++ program to find prime numbers upto n, an integer input (use for loop).
2. Write a C++ program to calculate Fibonacci numbers upto n, an integer input.
3. Write a C++ program that accepts a line of text and counts the number of times an individual vowel occurs in it (use control statement).
4. Write a C++ program to get the sum of the series.
5. Write a function count(number, array, length) that will count the number of times number appears in array..
6. Write a function that returns the maximum value of an array of numbers.
7. Define a class that will hold the set of integers from 0 to 31. An element can be set with the set member function and cleared with the clear member function. It is not an error to set an element that's already set or clear an element that's already clear. The function test is used to tell whether an element is set.
8. Write a C++ program that defines a class called student with roll no., name and percentage as its data members and getData() and printData() as member functions (no constructors).
9. Write a C++ program that creates an object and initializes its data members using constructor. Use constructor overloading concept.
10. Write your own simple Account class. You should be able to make deposits and withdrawals and read out the balance — a private double variable. Member functions should be: void Account::withdraw(const double &amount); //Take from account void Account::deposit(const double &amount); // Put into account double account::balance(void); //Return the balance Make sure that the Account constructor function initialises the balance to zero. If you like, add an overloaded constructor function to set an initial balance.
11. Write a C++ program that illustrates the order of construction destruction of class object.
12. Write a C++ program that illustrates the friend function for an unary minus (-) operator overloading.
13. Write a derived class DepositAccount that inherits from the Account class. The account should pay interest at an annual rate that is private member data, but impose a £10 fee for every withdrawal. You should overload the member functions of Account where necessary. How will you determine when to pay interest?
14. Write a simple class Enemy that has a name (std::string), a strength (int) and a boolean indicating if the enemy is alive. Two enemies are “equal” if they have the same strength and they are both alive or not. Implement the overloaded == operator.
15. Suppose we have an Employee class including a name, National Insurance number, etc. Suppose this class has two derived classes HourlyEmployee and CommissionEmployee, for people paid in different ways, and later we'll want a class for people paid both hourly and by commission. Inheritance appropriately. Sketch these classes, their fields and constructors and test the program.
16. Write a C++ program to illustrate a non-member function adding two Sales_item objects.
17. Write a C++ program that illustrates virtual function.
18. Write a C++ program to create a file and store information in it.
19. Write a C++ program to illustrate reading of data from a file.
20. Write a C++ program to count number of lines, blank lines, comments in a given program.
21. Write a template min that returns the minimum of two values.

BACA-5.3: Windows Programming

Teaching Hours: 4 Hrs/week

**Marks: Main Exam: 80
IA: 20**

UNIT I 10Hrs

Introduction to Visual Basic- Introduction Graphical User Interface (GUI), Programming Language (Procedural, Object Oriented, Event Driven), The Visual Basic Environment, How to use VB compiler to compile / debug and run the programs.

Introduction to VB Controls- Textboxes, Frames, Check Boxes , Option Buttons, Images, Setting a Border & Styles, The Shape Control, The line Control, Working with multiple controls and their properties, Designing the User Interface, Keyboard access, tab controls, Default & Cancel property, Coding for controls.

UNIT II 10Hrs

Variables, Constants, and Calculations- Variables, Variables Public, Private, Static, Constants, Data Types, Naming rules/conventions, Constants, Named & intrinsic, Declaring variables, Scope of variables, Val Function, Arithmetic Operations, Formatting Data.

Decision & Conditions- If Statement, If ?then-else Statement, Comparing Strings, Compound Conditions(And, Or, Not), Nested If Statements, Case Structure ,Using If statements with Option Buttons & Check Boxes, Displaying Message in Message Box, Testing whether Input is valid or not. Using Call Statement to call a procedure.

UNIT III 10Hrs

Menus, Sub-Procedures and Sub-functions- Defining / Creating and Modifying a Menu, Using common dialog box, Creating a new sub-procedure, Passing Variables to Procedures, Passing Argument ByVal or ByRef, Writing a Function Procedure, Multiple Forms- Creating , adding, removing Forms in project, Hide, Show Method, Load, Unload Statement, Me Keyword, Referring to objects on a Different Forms,List, Loops and Printing -List Boxes & Combo Boxes, Filling the List using Property window / AddItem Method, Clear Method, List box Properties, Removing an item from a list, List Box/ Combo Box, Do/Loops, For/Next Loops, Using MsgBox Function, Using String Function, Printing to printer using Print Method, Arrays Single- Dimension Arrays, Initializing an Array using for Each, User-Defined Data Types, Accessing Information with User-Defined Data Types, Using List Boxes with Array, Two dimensional arrays.

UNIT IV 10Hrs

OOP in VB- Classes, Creating a new Class, Creating a new object using a class, choosing when to create New Objects, The Initialize & Terminate events.

Data Files- Opening and Closing Data Files, The Free File Function, Viewing the data in a file, Sequential File Organization (Writing Data to a sequential Disk File, Creating a sequential data file, Reading the Data in a sequential file, Finding the end of a Data file, Locating a file). Trapping Program Errors, The Err Object, Random Data File Opening a random file, Reading and writing a random file(Get, Put, LOF, Seek).

UNIT V 10Hrs

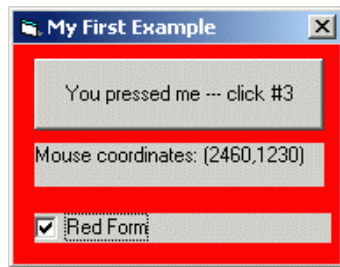
Accessing Database File -Creating the database files for use by Visual Basic (Using MS-Access), Using the Data Control ,setting its property, Using Data Control with forms, navigating the database in code (the recordset object using the movenext, moveprevious, movefirst & movelast methods, checking for BOF & EOF, using listboxes & comboboxes as data bound controls, updating a database file (adding, deleting records).

References:

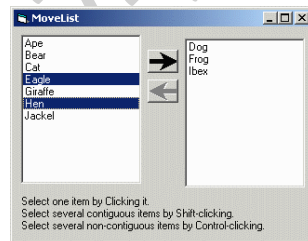
1. Professional Visual Basic 2010 and .NET 4, Wiley Publishing, Inc. 2010
2. Halvorson, Microsoft Visual Basic 2008 Step by Step, PHI
3. Alessandro Del Sole, Visual Basic 2015 Unleashed, Pearson Education

BACA-5.4: Computer Laboratory- Programming in VB
Practical Hours: 4 Hrs/week **Marks: Main exam: 40**
IA: 10

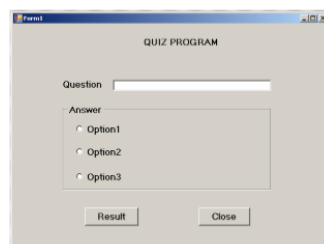
1. To accept a character from console and check the case of the character.
2. To accept any character from keyboard and display whether it is vowel or not (use text box, radio buttons, label and command button control)
3. To perform add, subtract, and multiply operations using text box controls and button controls and label to display the result.
4. To validate username and password and display appropriate message using message box control.
5. A simple hello world program that illustrates a basic VB program as well as the command button and timer control.
6. To change font size, font style and font of a text string using combo boxes.
7. To design a simple calculator.
8. Develop a menu based VB.NET application to implement a text editor with cut, copy, paste, saved and close operations.
9. Illustrate the following (It uses a command (or button), a label, and a checkbox)



10. An example of how to use listboxes (as well as how to put images into buttons). The example should let you move items between lists as shown in the figure

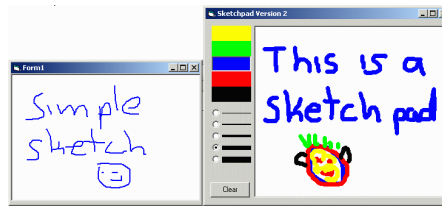


11. To play a wave file in Visual Basic. It works by declaring a function to the WIN32 API sndPlaySound.
12. Develop a form in VB.NET to pick a date from calendar control and display the day, month, year in separate text boxes.
13. To Develop a VB.NET application to perform timer based quiz of 5 questions.



14. Illustrates two simple sketchpads. The first one illustrates some very basic graphics and event handling. The second shows how one can dynamically create controls at run time (the items

on the palette), how controls can be positioned at runtime, and how controls can be resized when the window is resized.



15. Accessing database of students using the ADO Data Control.
16. To Develop a database application using ADO.NET with insert, delete and Update operations
17. Accessing databases using the Data Environment control.
18. To develop a VB.NET application using DataGrid to display the records in a table.
19. Create a simple ASP.NET page to output Text with a form , two HTML buttons and an HTML element. Create an event procedure for the button.
20. Creating a simple HelloWorld ActiveX control in Visual Basic

BACA-6.1: Multimedia and Animation

Teaching Hours: 4 Hrs/week

**Marks: Main Exam: 80
IA: 20**

- UNIT I** 10 hrs
 Introduction to Multimedia: Definition, CD-ROM and the multimedia highway, Uses of Multimedia, Introduction to making multimedia – The stages of Project, the hardware & software requirements to make good multimedia, Multimedia skills. Multimedia building blocks- SOUND: MIDI, Digital audio, audio file formats. Images: still images, color and file formats. ANIMATION: principles of animation, making animation. VIDEO: using video, how video works, and video standards.
- UNIT II** 08 hrs
 Input/Output Technologies, Traditional devices, Pen input, Video display systems, Scanners, Digital audio, Video images and animation. Multimedia communication systems, Authoring Applications, Video conferencing, Virtual reality, Interactive video, video on Demand.
- UNIT III** 12 hrs
 DHTML : Adding animation, multiplying the media, adding Interactivity (dragging and dropping) , working with data and dialog boxes, working with text, understanding browser object models, working with VB script and java script, embedding Active-X controls in web document.
- UNIT IV** 14 hrs
 Introduction to experimental animation, orientation into an visual art form, orientation into time and performing art form, Relevance of message, medium and a relationship, introduction to cut out animation,
 The basics of traditional 2D animation, introduction to skill required thereof, Beginning of line drawing, use of simple shapes. How to draw sketches with the help of basic shapes, Learning to draw lines, circles, ovals, scribbles, jig jag random patterns etc.
- UNIT V** 06 hrs
 Application Design, Application classes, Types of systems, Virtual reality design, Components, Database Authority Systems, Hyper media, User interface design, Display/Playback issues, Hypermedia linking and embedding.

References:

1. Tay Vaughan, Multimedia Making it work, 5th Edition, Tata McGraw Hill.
2. Pakhira, Malay K, Computer Graphics, Multimedia And Animation, PHI
3. Chuckmusiano and Bill Kenndy, HTML The Definite Guide , O Reilly publications.
4. Ralf Steinmetz, Klara steinmetz, Multimedia Computing, Communications and Applications, Pearson education.
5. Evangeline, D. , Anitha, S, Computer Graphics And Multimedia Insights, Mathematical Models and Programming Paradigms, Phi
6. Vaughan T, Multimedia, Tata McGraw Hill, 1999
7. Robert Russett and Cicele Starr, Experimental Animation: an illustrated anthology, Van Nostrand Reinhold Inc., U.S.

BACA-6.2: Computer Laboratory- Animation Lab.				
<table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">Practical Hours: 4 Hrs/week</td> <td style="text-align: right;">Marks: Main exam: 40</td> </tr> <tr> <td></td> <td style="text-align: right;">IA: 10</td> </tr> </table>	Practical Hours: 4 Hrs/week	Marks: Main exam: 40		IA: 10
Practical Hours: 4 Hrs/week	Marks: Main exam: 40			
	IA: 10			

Software: Macromedia FLASH/similar software like Dreamweaver
 Students shall know the basics of using Photoshop and flash softwares, and implement the following assignments

1. To create an animation to represent the growing moon.
2. To create an animation to indicate a ball bouncing on steps
3. To simulate movement of a cloud
4. To simulate moving of fan blades.
5. To create animation to display “WELCOME” character by character with change in colors and final display in one color
6. To simulate hitting of two balls together
7. To prepare a cover page of a Book
8. To prepare a visiting card with one image.
9. To extract the flower only from given photographic image and organise it on a background. selecting your own background for organisation
10. To adjust the brightness and contrast of the picture/image
11. To type a word and apply the effects shadow emboss
12. Cutting and organizing related pictures stored in different files.
13. Positioning the birds and changing the colors of the birds of choice
14. Changing shapes (eg. circllet to rectangle) using FLASH
15. To Use a audio processing Software and perform the audio editing tasks – Import audio, Select and edit the sound, Create fade-in fade-out effects, Label audio segments, Use noise remove filter, Mix audio, Change stero to mono tracks, Export audio to different format and save

BACA-6.3: Introduction to Information Security				
<table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">Teaching Hours: 4 Hrs/week</td> <td style="text-align: right;">Marks: Main Exam: 80</td> </tr> <tr> <td></td> <td style="text-align: right;">IA: 20</td> </tr> </table>	Teaching Hours: 4 Hrs/week	Marks: Main Exam: 80		IA: 20
Teaching Hours: 4 Hrs/week	Marks: Main Exam: 80			
	IA: 20			

UNIT I 10Hrs
 Information Security: Network security, Confidentiality, integrity, authentication, security policy, basic network security terminology, cryptography, symmetric encryption, substitution ciphers, transposition ciphers, steganography, Block ciphers, modes of operation, Data Encryption Standard, Public key cryptography, applications, strength and weakness, RSA algorithm, key distribution (concepts only).

UNIT II 10Hrs
 Authentication, authentication methods, message digest, digital signatures, digital signature algorithm, DSS, E-mail security: Pretty Good Privacy, working of PGP, S/MIME, MIME, IP Security, Architecture, IPSec: strengths and benefits, IPv4, IPv6, ESP protocol.

UNIT III 10Hrs
 Web Security: Secure Socket layer, SSL session and connection.
 Malicious Software, viruses, working of anti-virus software, worms, Trojans, spyware, firewall, characteristics of firewall, packet filters, application level gateways, firewall architecture, trusted systems.

UNIT IV 10Hrs
 Security and Law:- Regulations in India. Information Technology Act 2000/2008. Cyber Crime and the IT Act 2000/2008. Indian Contract Act 1872, Indian Penal Code, Indian Copyright Act, Consumer Protection Act. Future Trends – The Law of Convergence.

UNIT V 10Hrs
 AES, Blowfish algorithms, Kerberos, Comparison of PGP and S/MIME, study of common malicious software, antiviruses.

References:

1. Core Brijendra Singh, Cryptography & Network Security, PHI.
2. Pachghare, V.K., Cryptography and Information Security, PHI
3. Atul Kahate, Cryptography and Network Security, 3rd Edition, McGraw Hill
4. Eric Maiwald, Fundamentals of Network Security, McGraw Hill
5. Patel, Dhiren R., Information Security : Theory And Practice , PHI

BACA-6.4: Computer Laboratory-Project: Application development
Teaching Hours: 4 Hrs/week Marks: Main Exam: 40
IA: 10

The students shall carry out project work in a group of two or three under the supervision of course teacher. The project work shall be carried out in the lab. (in-house project).

No restrictions shall be placed on the students in the choice of type of the application/platforms/tools/ languages to be utilized for their project work, though open source is strongly recommended, wherever possible.

The phases for the project are: Problem identification, Investigation of system requirements, Data and Process Modelling, System Design, Program design, Program coding and unit testing, System integration, System implementation and acceptance testing.

The outcome of the application development shall be documented as project document which shall be evaluated as part of final examination.

Final Examination details:

Max. Marks: 40	
Project documentation evaluation	: 25
Demo of the application	: 10
Viva-Voce	: 05

Note: For every three groups (each group comprising of two or three students as mentioned above) a course teacher shall be identified for guiding the project work.

Theory and Practical Evaluation Scheme

V. Theory Examination-

Max. Marks: 80

Duration - 3 Hours.

Theory question paper pattern:-		
Questions	Marks	Remarks
SECTION A Q1. Answer all the questions 10 sub questions (a-j)	2 x 10 =20	ability to write short answers upto 150 words
SECTION B Q2. through Q6: Answer any four questions	4 x 5=20	ability to write answers upto 500 word
SECTION C Q7. through Q11: Answer any four questions	4 x 10=40	ability to write descriptive answers

Note: For Section-B, one question from each unit shall be considered. For Section-C, one question from each unit shall be considered.

VI. Practical Examination

Max. Marks: 40 Marks

Duration - 3 Hours.

Certified Journal is compulsory for appearing Practical Examination

Students shall be given two programming assignments taking into consideration of duration of the time allotted to students for writing, typing and executing the programs.

Algorithm/program design	: 15
Execution	: 15 (includes program code correctness and correct execution results)
Journal	: 05
Viva-Voce	: 05

Note: Guidelines given by the University from time-to-time shall be followed for IA.