Generic Elective Syllabus

For

B.A. Program with Computer Applications
Dibrugarh University

Under
Choice Based Credit System

Generic Elective Papers (GE) (Minor – Computer Application) for other Departments/Disciplines: (Credit: 06 each)

GE-1
1. Computer Fundamentals (4) + Lab (4)

GE-2
1. Multimedia and Applications (4) + Lab (4)

GE-3
1. Introduction to Programming (4) + Lab (4)

GE-4
1. Desktop Publishing (4) + Lab (4)

Detailed Syllabus

Generic Elective Courses

Computer Fundamentals
Theory: 60 lectures

Introduction: Introduction to computer system, uses, types.   6L

Data Representation: Number systems and character representation, binary **12L**
arithmetic

6L

Human Computer Interface: Types of software, Operating system as user
interface, utility programs

10L

Devices: Input and output devices (with connections and practical demo),
keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera,
monitor, printer, plotter

6L

Memory: Primary, secondary, auxiliary memory, RAM, ROM, cache memory,
hard disks, optical disks

12L

Computer Organisation and Architecture: C.P.U., registers, system bus, main
memory unit, cache memory, Inside a computer, SMPS, Motherboard, Ports and
Interfaces, expansion cards, ribbon cables, memory chips, processors.

8L

Overview of Emerging Technologies: Bluetooth, cloud computing, big data,
data mining, mobile computing and embedded systems.

Reference Books:
1. A. Goel, Computer Fundamentals, Pearson Education, 2010.
2. P. Aksoy, L. DeNardis, Introduction to Information Technology, Cengage Learning, 2006
3. P. K.Sinha, P. Sinha, Fundamentals of Computers, BPB Publishers, 2007

Computer Fundamentals Lab

Practical: 60 lectures

Practical exercises based on MS Office/ Open Office tools using document preparation and
spreadsheet handling packages.

MS Word

1. Prepare **a grocery list** having four columns (Serial number, The name of the
   product, quantity and price) for the month of April, 06.

   - Font specifications for Title (Grocery List): 14-point Arial font in bold and italics.
   - The headings of the columns should be in 12-point and bold.
   - The rest of the document should be in 10-point Times New Roman.
   - Leave a gap of 12-points after the title.

2. Create a **telephone directory**.
   - The heading should be 16-point Arial Font in bold
   - The rest of the document should use 10-point font size
   - Other headings should use 10-point Courier New Font.
   - The footer should show the page number as well as the date last updated.

3. Design a **time-table form** for your college.
   - The first line should mention the name of the college in 16-point Arial Font
     and should be bold.
   - The second line should give the course name/teacher's name and the department
     in 14-point Arial.

- Leave a gap of 12-points.
- The rest of the document should use 10-point Times New Roman font.
- The footer should contain your specifications as the designer and date of creation.

4.   BPB Publications plans to release a new book designed as per your syllabus. Design the **first page of the book** as per the given specifications.
- The title of the book should appear in bold using 20-point Arial font.
- The name of the author and his qualifications should be in the center of the page in 16-point Arial font.
- At the bottom of the document should be the name of the publisher and address in 16-point Times New Roman.
- The details of the offices of the publisher (only location) should appear in the footer.

5.   Create the following one page documents.
   a. Compose a note inviting friends to a get-together at your house, Including a list of things to bring with them.
   b. Design a certificate in landscape orientation with a border around the document.
   c. Design a Garage Sale sign.
   d. Make a sign outlining your rules for your bedroom at home, using a numbered list.

6.   Create the following documents:
   (a) A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.
   (b) Use a newsletter format to promote upcoming projects or events in your classroom or college.

7.   Convert following text to a table, using comma as delimiter
   Type the following as shown (do not bold).
   Color, Style, Item
   Blue, A980, Van
   Red, X023, Car
   Green, YL724, Truck
   Name, Age, Sex
   Bob, 23, M
   Linda, 46, F
   Tom, 29, M

9. Enter the following data into a table given on the next page.

Salesperson	Dolls	Trucks	Puzzles
Kennedy, Sally	1327	1423	1193
White, Pete	1421	3863	2934
Pillar, James	5214	3247	5467
York, George	2190	1278	1928
Banks, Jennifer	1201	2528	1203
Atwater, Kelly	4098	3079	2067

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Add a column Region (values: S, N, N,S,S,S) between the Salesperson and Dolls columns to the given table Sort your table data by Region and within Region by Salesperson in ascending order:

In this exercise, you will add a new row to your table, place the word "Total" at the bottom of the Salesperson column, and sum the Dolls, Trucks, and Puzzles columns.

10.   Wrapping of text around the image.

11.   Following features of menu option must be covered

FILE   Complete menu
EDIT   Complete menu
VIEW   Complete menu
INSERT   Complete menu
FORMAT   Complete menu
TABLE   Complete menu
WINDOW   Complete menu
HELP   Complete menu
TOOLS   All options except Online collaboration, Tools on Macro, Templates

MS Excel

1.   Enter the Following data in Excel Sheet

REGIONAL SALES PROJECTION

State	Qtr1	Qtr2	Qtr3	QTR4	Qtr Total	Rate	Amount
Delhi	2020	2400	2100	3000		15	
Punjab	1100	1300	1500	1400		20	
U.P.	3000	3200	2600	2800		17	
Haryana	1800	2000	2200	2700		15	
Rajasthan	2100	2000	1800	2200		20	

TOTAL
AVERAGE

(a) Apply Formatting as follow:
        I.Title in TIMES NEW ROMAN

ii.   Font Size - 14

iii.   Remaining text - ARIAL, Font Size -10

iv.   State names and Qtr. Heading Bold, Italic with Gray Fill Color.

v.   Numbers in two decimal places.

vi.   Qtr. Heading in center Alignment.

vii.   Apply Border to whole data.

(b) Calculate State and Qtr. Total

(c) Calculate Average for each quarter

(d) Calculate Amount = Rate * Total.

2. Given the following worksheet

	A	B	C	D
1	Roll No.	Name	Marks	Grade
2	1001	Sachin	99	
3	1002	Sehwag	65	
4	1003	Rahul	41	
5	1004	Sourav	89	
6	1005	Har Bhajan	56	

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
$>= 80$	A+
$>= 60 < 80$	A
$>= 50 < 60$	B
< 50	F

3. Given the following worksheet

	A	B	C	D	E	F	G
1	**Salesman**			**Sales in (Rs.)**			
2	No.	Qtr1	Qtr2	Qtr3	Qtr4	Total	Commission
3	S001	5000	8500	12000	9000		
4	S002	7000	4000	7500	11000		
5	S003	4000	9000	6500	8200		
6	S004	5500	6900	4500	10500		
7	S005	7400	8500	9200	8300		
8	S006	5300	7600	9800	6100		

Calculate the commission earned by the salesmen on the basis of following Candidates:

If Total Sales	Commission
< 20000	0% of sales
> 20000 and < 25000	4% of sales

> 25000 and < 30000	5.5% of sales
> 30000 and < 35000	8% of sales
>= 35000	11% of sales

The total sales is sum of sales of all the four quarters.

4. A company XYZ Ltd. pays a monthly salary to its employees which consists of basic salary, allowances & deductions. The details of allowances and deductions are as follows:

Allowances

- HRA Dependent on Basic

    30% of Basic if Basic <=1000

    25% of Basic if Basic>1000 & Basic<=3000

    20% of Basic if Basic >3000

- DA Fixed for all employees, 30% of Basic

- Conveyance Allowance Rs. 50/- if Basic is <=1000

    Rs. 75/- if Basic >1000 & Basic<=2000

    Rs. 100 if Basic >2000

    - Entertainment Allowance NIL if Basic is

    <=1000 Rs. 100/- if Basic > 1000

Deductions

- Provident Fund   6% of Basic
- Group Insurance Premium   Rs. 40/- if Basic is <=1500

    Rs. 60/- if Basic > 1500 & Basic<=3000

    Rs. 80/- if Basic >3000

Calculate the following:

Gross Salary   = Basic + HRA + DA + Conveyance + Entertainment

Total deduction   = Provident Fund + Group Insurance Premium

Net Salary   = Gross Salary – Total Deduction

5. Create Payment Table for a fixed Principal amount, variable rate of interests and time in the format below:

No. of Instalments	5%	6%	7%	8%	9%
3	XX	XX	XX	XX	XX
4	XX	XX	XX	XX	XX
5	XX	XX	XX	XX	XX
6	XX	XX	XX	XX	XX

6. Use an array formula to calculate Simple Interest for given principal amounts given the rate of Interest and time

Rate of Interest	8%
Time	5 Years
Principal	Simple Interest
1000	?

18000	?
5200	?

7. The following table gives year wise sale figure of five salesmen in Rs.

Salesman	2000	2001	2002	2003
S1	10000	12000	20000	50000
S2	15000	18000	50000	60000
S3	20000	22000	70000	70000
S4	30000	30000	100000	80000
S5	40000	45000	125000	90000

(*a*) Calculate total sale year wise.

(*b*) Calculate the net sale made by each salesman

(*c*) Calculate the maximum sale made by the salesman

(d) Calculate the commission for each salesman under the condition.

 (*i*) If total sales >4,00,000 give 5% commission on total sale made by the salesman.

 (*ii*) Otherwise give 2% commission.

(*e*) Draw a bar graph representing the sale made by each salesman.

(*f*) Draw a pie graph representing the sale made by salesman in 2000.

8. Enter the following data in Excel Sheet

PERSONAL BUDGET FOR FIRST QUARTER

Monthly Income (Net): 1,475

EXPENSES	JAN	FEB	MARCH	QUARTER TOTAL	QUARTER AVERAGE
Rent600.00	600.00	600.00			
Telephone	48.25	43.50	60.00		
Utilities	67.27	110.00	70.00		
Credit Card	200.00	110.00	70.00		
Oil	100.00	150.00	90.00		
AV to Insurance	150.00				
Cable TV	40.75	40.75	40.75		

Monthly Total

Calculate Quarter total and Quarter average.

 (a) Calculate Monthly total.

 (b) Surplus = Monthly income - Monthly total.

 (c) What would be total surplus if monthly income is 1500.

 (d) How much does telephone expense for March differ from quarter average.

 (e) Create a 3D column graph for telephone and utilities.

 (f) Create a pie chart for monthly expenses.

9. Enter the following data in Excel Sheet

TOTAL REVENUE EARNED FOR SAM'S BOOKSTALL

Publisher name	1997	1998	1999	2000	total
A	Rs. 1,000.00	Rs. 1100.00	Rs. 1,300.00	Rs. 800.00	
B	Rs. 1,500.00	Rs. 700.00	Rs. 1,000.00	Rs. 2,000.00	
C	Rs. 700.00	Rs. 900.00	Rs. 1,500.00	Rs. 600.00	
D	Rs. 1,200.00	Rs. 500.00	Rs. 200.00	Rs. 1,100.00	
E	Rs 800.00	Rs. 1,000.00	Rs. 3,000.00	Rs. 560.00	

(a) Compute the total revenue earned.

(b) Plot the line chart to compare the revenue of all publisher for 4 years.

(b) Chart Title should be _Total Revenue of sam's Bookstall (1997-2000)'

(c) Give appropriate categories and value axis title.

10. Generate 25 random numbers between 0 & 100 and find their sum, average and count. How many no. are in range 50-60

13. **Multimedia and Applications**
Theory: 60 lectures

Multimedia: Introduction to multimedia, components, uses of multimedia, **6L** multimedia applications, virtual reality.

Text: Fonts & Faces, Using Text in Multimedia, Font Editing & Design Tools, **4L** Hypermedia & Hypertext.

Images: Still Images – bitmaps, vector drawing, 3D drawing & rendering, natural **6L** light & colors, computerized colors, color palettes, image file formats.

Sound: Digital Audio, MIDI Audio, MIDI vs Digital Audio, Audio File Formats. **6L**

Video: How video works, analog video, digital video, video file formats, video **8L** shooting and editing.

Animation: Principle of animations, animation techniques, animation file formats. **10L**

Internet and Multimedia: www and HTML, multimedia on the web – web servers, **6L** web browsers, web page makers and site builders.

Making Multimedia: Stages of a multimedia project, Requirements to make good **14L** multimedia, Multimedia Hardware - Macintosh and Windows production Platforms, Hardware peripherals - Connections, Memory and storage devices, Multimedia software and Authoring tools.

References:
1. Tay Vaughan, ―Multimedia: Making it work‖, TMH, Eighth edition.2011
2. Ralf Steinmetz and KlaraNaharstedt, ―Multimedia: Computing, Communications Applications‖, Pearson.2012
3. Keyes, ―Multimedia Handbook‖, TMH,2000.
4. K. Andleigh and K. Thakkar, ―Multimedia System Design‖, PHI.2013

Multimedia and Applications Lab
Practical: 60 lectures
Practical exercises based on concepts listed in theory using Flash/ GIMP/ PhotoShop/ Animation Tools/ Image Editors/ Video Editors.

Optional

Implement the followings using Flash-

1. Create an animation using the tools panel and the properties panel to draw the following – Line, pe , oval, circle, rectangle , square, pencil , brush , lasso tool
2. Create an animation using text tool to set the font , size , color etc.
3. Create an animation using**Free transform tool** that should use followings-

   Move Objects
   Skew Objects
   Stretch Objects
   Rotate Objects
   Stretch Objects while maintaining proportion
   Rotate Objects after relocating the center dot

4. Create an animation using layers having following features-Insert layer, Delete layer, guide layer, Mask layer.
5. Modify the document (changing background color etc.)using the following tools

   Eraser tool
   Hand tool Ink
   bottle tool
   Zoom tool
   Paint Bucket tool
   Eyedropper tool

6. Create an animation for bus car race in which both starts from the same point and car wins the race.
7. Create an animation in which text Hello gets converted into GoodBye (using motion/shape tweening).
8. Create an animation having five images having fade-in fade-out effect.
9. Create an scene to show the sunrise (using multiple layers and motion tweening)
10. Create an animation to show the ripple effect.
11. Create an animation (using Shape tweening and shape hints) for transforming one shape into another.
12. Create an animation for bouncing ball (you may use motion guide layer).

Introduction to Programming
Theory: 60 lectures
Introduction to C and C++ **(5 Lectures)**

History of C and C++, Overview of Procedural Programming and Object-Orientation Programming, Using main() function, Compiling and Executing Simple Programs in C++.

Data Types, Variables, Constants, Operators and Basic I/O **(10 Lectures)**

Declaring, Defining and Initializing Variables, Scope of Variables, Using Named Constants, Keywords, Data Types, Casting of Data Types, Operators (Arithmetic, Logical and Bitwise), Using Comments in programs, Character I/O (getc, getchar, putc, putcharetc), Formatted and Console I/O (printf(), scanf(), cin, cout), Using Basic Header Files (stdio.h, iostream.h, conio.hetc).

Expressions, Conditional Statements and Iterative Statements **(10 Lectures)**

Simple Expressions in C++ (including Unary Operator Expressions, Binary Operator Expressions), Understanding Operators Precedence in Expressions, Conditional Statements (if construct, switch-case construct), Understanding syntax and utility of Iterative Statements (while, do-while, and for loops), Use of break and continue in Loops, Using Nested Statements (Conditional as well as Iterative)

Functions and Arrays **(10 Lectures)**

Utility of functions, Call by Value, Call by Reference, Functions returning value, Void functions, Inline Functions, Return data type of functions, Functions parameters, Differentiating between Declaration and Definition of Functions, Command Line Arguments/Parameters in Functions, Functions with variable number of Arguments.

Creating and Using One Dimensional Arrays (Declaring and Defining an Array, Initializing an Array, Accessing individual elements in an Array, Manipulating array elements using loops), Use Various types of arrays (integer, float and character arrays / Strings) Two-dimensional Arrays (Declaring, Defining and Initializing Two Dimensional Array, Working with Rows and Columns), Introduction to Multi-dimensional arrays

Derived Data Types (Structures and Unions) **(5 Lectures)**

Understanding utility of structures and unions, Declaring, initializing and using simple structures and unions, Manipulating individual members of structures and unions, Array of Structures, Individual data members as structures, Passing and returning structures from functions, Structure with union as members, Union with structures as members.

File I/O, Preprocessor Directives   (8 Lectures)

Opening and closing a file (use of fstream header file, ifstream, ofstream and fstream classes), Reading and writing Text Files, Using put(), get(), read() and write() functions, Random access in files, Understanding the Preprocessor Directives (#include, #define, #error, #if, #else, #elif, #endif, #ifdef, #ifndef and #undef), Macros

Using Classes in C++   (8 Lectures)

Principles of Object-Oriented Programming, Defining & Using Classes, Class Constructors, Constructor Overloading, Function overloading in classes, Class Variables &Functions, Objects as parameters, Specifying the Protected and Private Access, Copy Constructors, Overview of Template classes and their use.

Inheritance and Polymorphism   (4 Lectures)

Introduction to Inheritance and Polymorphism

Reference Books:

1. HerbtzSchildt, "C++: The Complete Reference", Fourth Edition, McGraw Hill.2003
2. BjarneStroustrup, "The C++ Programming Language", 4th Edition, Addison-Wesley , 2013.
3. BjarneStroustroup, "Programming -- Principles and Practice using C++", 2nd Edition, Addison-Wesley 2014.
4. E Balaguruswamy, "Object Oriented Programming with C++", Tata McGraw-Hill Education, 2008.
5. Paul Deitel, Harvey Deitel, "C++ How to Program", 8th Edition, Prentice Hall, 2011.
6. John R. Hubbard, "Programming with C++", Schaum's Series, 2nd Edition, 2000.
7. Andrew Koeni, Barbara, E. Moo, "Accelerated C++", Published by Addison-Wesley , 2000.
8. Scott Meyers, "Effective C++", 3rd Edition, Published by Addison-Wesley, 2005.
9. Harry, H. Chaudhary, "Head First C++ Programming: The Definitive Beginner's Guide", First Create space Inc, O-D Publishing, LLC USA.2014
10. Walter Savitch, "Problem Solving with C++", Pearson Education, 2007.
11. Stanley B. Lippman, JoseeLajoie, Barbara E. Moo, "C++ Primer", Published by Addison-Wesley, 5th Edition, 2012

Introduction to c/c++ Programming Lab

Practical: 60 lectures

1. Write a program to find greatest of three numbers.
2. Write a program to find gross salary of a person
3. Write a program to find grade of a student given his marks.
4. Write a program to find divisor or factorial of a given number.
5. Write a program to print first ten natural numbers.
6. Write a program to print first ten even and odd numbers.
7. Write a program to find grade of a list of students given their marks.
8. Create Matrix class. Write a menu-driven program to perform following Matrix operations (2-D array implementation):
    a) Sum   b) Difference c) Product   d) Transpose

Desktop Publishing
Theory: 60 lectures
PageMaker   **10L**
Page layout Basics, entering text, encoding schemes, defining styles, saving files, creating frame, inserting &removing pages, adding shapes, creating header &footer, using color, printing.
CorelDraw   **15L**
Drawing Shapes & Graphics, Use of basic tools, Logos & Artistic Text, Multicolor Designs, adding special effects, inserting symbols.
Photoshop   **15L**
Image/Photo Editing-Mixing-Enhancements, Creating Digital Images & Backgrounds, Creating Web Graphics.
Printing   **10L**
Types of Printing an Introduction-Letterpress printing-lithography-offset printing- different printing process-machines for letterpress, offset, gravure, flexography and screen printing-printing materials.

Reference Books:
1. Taxali R.K.,, "Simplex Computer Course", Tata McGraw Hill, 2011.
2. Campbell M., "Pagemaker 7.0 From A to Z", Independent Publishers Group, 2001.
3. Ocampo P., "Adobe Photoshop CC 2014 for Visual Learners", 1st Edition, Paolo Ocampo, 2014.
4. Kroenke D., Nilson D., "Microsoft Office 365 in Business", US Edition, Wiley India Pvt. Ltd, 2011.
5. Jain S. "MS Office 2010 Training Guide", BPB Publications, 2010.

Desktop Publishing Lab
Practical: 60 lectures
Hands on Practice on PageMaker, CorelDraw, Adobe Photoshop, Printing