



**Sophia Girls' College (Autonomous),  
Ajmer**



**Department of Computer Science**

**Course Plan**

**Mr. Rishi Saxena**



**SOPHIA GIRL'S COLLEGE, AJMER (AUTONOMOUS)**

**VCA Semester II (2021-22)**

**Computer Fundamentals – II**

Max. Marks :75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int)

Credit: 03

| SEM II<br>Month | UNIT/TOPIC  | Concepts/facts        | Teaching<br>Pedagogy | Learning<br>Outcomes   | Questions   | Marks<br>Weightage<br>(%)                            |
|-----------------|---|-----------------------|----------------------|--|---|--|
| SEM II<br>JAN   | Unit I<br>Introduction to memory, classifications, random-access memory, volatile memory, non-volatile memory, flash memory, read-only memory, secondary memory, the cache memory, auxiliary storage memory                                 | Computer Memory       | PPT                  | Identify computer memory according to its accessibility and hardware | <u>Knowledge Based</u><br><br><u>Define computer memory</u><br><br><u>Understanding Based</u><br><br>Difference between volatile and non-volatile storage | Knowledge--50<br>Understanding-35<br>Higher Order-15 |
|                 | memory hierarchy, storage device, magnetic tape, magnetic disk, floppy disk, hard disks, CD, DVD, magneto-optical.  | Storage Devices       | Hardware assignments |  |   |  |
| FEB             | Unit II<br>Number system: binary, octal, hexadecimal, addition, subtraction, multiplications. Computer code: BCD, ASCII, EBCDIC code, Excess-3 code, gray code, logic gates and Boolean algebra representation and simplifications by k Map | Number system & Codes | Numerical questions  | Convert values in different number systems                           | <u>Higher Order Thinking Skills Based</u><br><br>Design a data warehouse model  |  |
|                 | Introduction to Data warehouse, components of a data warehouse, different   | Data warehouse        | PPT                  |  |   |  |



|                 |   |                        |                          |   |  |  |
|-----------------|---|------------------------|--------------------------|---|--|--|
|                 | methods of storing data in a data warehouse, advantages of using data warehouse.  |                        |                          |   |  |  |
| MARCH-<br>APRIL | Unit III<br>Software: System software, application software, programming software.<br>Computer Viruses: Introduction, history, types of computer viruses, classification of viruses, symptoms of a computer virus, & ways to catch a computer virus.  | Software and its types | Installation Assignments | Generalize the software according to their uses |  |  |
|                 | Introduction of Internet, history, TCP / IP & UDP, application protocol, world wide web, how the web works, web standards, website, overview, types of websites, electronic mail, e-mail header, saved message file extension, messages and mailboxes, introduction to intranet, uses, advantages, disadvantages. | Internet & web         | Web based Assignments    |   |  |  |

**Head**  
Department of Computer Science  
Sophia Girls' College  
(Autonomous), Ajmer

**PRINCIPAL**  
SOPHIA GIRLS' COLLEGE  
(AUTONOMOUS)  
AJMER



# SOPHIA GIRL'S COLLEGE, AJMER (AUTONOMOUS)

## BCA Semester VI (2021-22)

### C # Programming

Max. Marks :70 (70Ext; 30 Int) Min. Marks: 40(28 Ext;12 Int)

Credit: 04

| SEM VI<br>Month | UNIT/TOPIC  | Concepts/facts      | Teaching<br>Pedagogy    | Learning<br>Outcomes                            | Questions   | Marks<br>Weightage<br>(%)                            |
|-----------------|---|---------------------|-------------------------|---|---|--|
| SEM VI<br>JAN   | Unit I<br>C# : Evolution, History & Overview. Fundamentals of C#: Identifiers, Keywords, Literals, Punctuators, Operators. Data Types : Value Type & ReferenceType. Expressions: Implicit & Explicit Conversion (Boxing & Unboxing).              | Data types          | PPT                     | Understand and apply concept and features of C# | <u>Knowledge Based</u><br><br>Define C# operations<br><br><u>Understanding Based</u><br><br>Difference between branching and iteration<br><br><u>Higher Order Thinking Skills Based</u> | Knowledge--50<br>Understanding-35<br>Higher Order-15 |
|                 | Program Flow Controls: Decision Control -(if, if – else, Nesting), Switch, Ternary. Loop – (while, do-while, for, foreach, Nesting). break, continue, goto statements. User Defined Data Types: Arrays (Single, Multi & Jagged), Structure & Enum | Branching & Looping | Programming assignments |   |   |  |
| FEB             | Unit II<br>Class: Structure of Class, Objects, Class Modifiers (private, public, protected, internal, protected internal, abstract, sealed) Constructors  | OOP                 | Programming assignments | Know the concept of OOP Features                | Design an OOP model   |  |

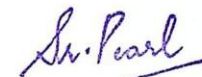


|                 |  |                |                         |  |  |  |
|-----------------|--|----------------|-------------------------|--|--|--|
|                 | (default, parameterized, Copy), Destructor. This reference, Static, Constant and Readonly members  |                |                         |  |  |  |
|                 | Methods: Parameter Passing (Value, Reference, Params). Inheritance, Polymorphism, Interfaces: Concept, Types, Modifiers (Virtual, Override, New).  | Inheritance    | Programming assignments |  |  |  |
| MARCH-<br>APRIL | Unit III<br>Method Overloading, Operator Overloading. Properties, Indexers, Delegates: Single Cast delegate, Multi Cast delegates, Passing delegate as parameter. Events: Concept & Declaration, Event Handlers. | Delegates      | Programming assignments | Handle events and errors occurring in the system |  |  |
|                 | Errors & Exceptions: Types of Errors, Try-Catch, Nested Try blocks, Throwing own exceptions, Multithreading: Creating & Starting a Thread, Scheduling, Synchronization.  | Error handling | Programming assignments |  |  |  |



Head  
Department of Computer Science  
Sophia Girls' College  
(Autonomous), Ajmer





PRINCIPAL  
SOPHIA GIRLS' COLLEGE  
(AUTONOMOUS)  
AJMER





# SOPHIA GIRL'S COLLEGE, AJMER (AUTONOMOUS)

MSc CS Semester II (2021-22)

## Image Processing

Max. Marks :70 (70Ext; 30 Int) Min. Marks: 40(28 Ext;12Int)

Credit: 06

| SEM VI<br>Month | UNIT/TOPIC  | Concepts/facts    | Teaching<br>Pedagogy     | Learning<br>Outcomes   | Questions   | Marks<br>Weightage<br>(%)                            |
|-----------------|---|-------------------|--------------------------|--|---|--|
| SEM VI<br>JAN   | Unit I<br>Introduction and Digital Image<br>Fundamentals Digital Image<br>Fundamentals, Human visual<br>system, Image as a 2D data,<br>Image representation – Gray<br>scale and Color images, image<br>sampling and quantization<br>Image enhancement in Spatial<br>domain: Basic gray level<br>Transformations, Histogram<br>Processing Techniques, Spatial<br>Filtering, Low pass filtering,<br>High pass filtering | Digital Images    | PPT                      | Apply<br>knowledge of<br>mathematics<br>for image<br>understanding<br>and analysis | <u>Knowledge Based</u><br><br>Define a digital<br>image as 2D data<br><br><u>Understanding<br/>Based</u><br><br>Difference between<br>various filtering<br>techniques | Knowledge--50<br>Understanding-35<br>Higher Order-15 |
|                 | Filtering in the Frequency<br>Domain: Preliminary Concepts,<br>Extension to functions of two<br>variables, Image Smoothing,<br>Image Sharpening,<br>Homomorphic filtering   | Filtering         | Numerical<br>assignments |  | <u>Higher Order<br/>Thinking Skills Based</u><br><br>Design an image<br>restoration model   |  |
| FEB             | Unit II<br>Image Restoration and<br>Reconstruction: Noise Models,<br>Noise Reduction, Inverse   | Image Restoration | MATLAB<br>assignments    | Design and<br>analysis of<br>techniques /  |   |  |



|                 |   |                                   |                       |  |  |  |
|-----------------|---|-----------------------------------|-----------------------|--|--|--|
|                 | Filtering, MMSE (Wiener)<br>Filtering Color Image<br>Processing: Color<br>Fundamentals, Color Models,<br>Pseudo color image processing  |                                   |                       | processes for<br>image<br>understanding  |  |  |
|                 | Image Compression:<br>Fundamentals of redundancies,<br>Basic Compression Methods:<br>Huffman coding, Arithmetic<br>coding, LZW coding, JPEG<br>Compression standard   | Image compression                 | MATLAB<br>assignments |  |  |  |
| MARCH-<br>APRIL | Unit III<br>Morphological Image<br>Processing: Erosion, dilation,<br>opening, closing, Basic<br>Morphological Algorithms: 04<br>08 hole filling, connected<br>components, thinning,<br>skeletons  | Morphological Image<br>Processing | MATLAB<br>assignments | Design, realize<br>and<br>troubleshoot<br>various<br>algorithms for<br>image<br>processing<br>case studies |  |  |
|                 | Object Recognition and Case<br>studies Object Recognition-<br>patterns and pattern classes,<br>recognition based on decision –<br>theoretic methods, structural<br>methods, case studies – image<br>analysis Application of Image<br>processing in process industries | Object Recognition                | MATLAB<br>assignments |  |  |  |

**Head**  
**Department of Computer Science**  
**Sophia Girls' College**  
**(Autonomous), Ajmer**

**PRINCIPAL**  
**SOPHIA GIRLS' COLLEGE**  
**(AUTONOMOUS)**  
**AJMER**