

<b>1. Writes Programs to solve problem</b>	
<b>Competency Level</b>	<b>Content</b>
1.1 Develops algorithms to solve problems	<ul style="list-style-type: none"> <li>• Definition of algorithm</li> <li>• Definition of problems               <ul style="list-style-type: none"> <li>o Inputs</li> <li>o Processes</li> <li>o Outputs</li> </ul> </li> <li>• Control structures used for developing algorithms               <ul style="list-style-type: none"> <li>o Sequence</li> <li>o Selection</li> <li>o Repetition</li> </ul> </li> </ul>
1.2 Uses different tools to present algorithms.	<ul style="list-style-type: none"> <li>• Tools for developing algorithms               <ul style="list-style-type: none"> <li>o Flow chart</li> <li>o Pseudo code</li> </ul> </li> </ul>
1.3 Explores the evolution of programming languages	<ul style="list-style-type: none"> <li>• Generations of Languages               <ul style="list-style-type: none"> <li>o First Generation</li> <li>o Second Generation</li> <li>o Third Generation</li> <li>o Fourth Generation</li> </ul> </li> <li>• Features of Languages Mechanism (tools) used to convert source code to machine code               <ul style="list-style-type: none"> <li>o Assembler</li> <li>o Interpreters</li> <li>o Compilers</li> </ul> </li> </ul>
1.4 Demonstrates familiarity on the IDE of a selected Visual Programming Language	<ul style="list-style-type: none"> <li>• Components of Integrated Development Environment (IDE)               <ul style="list-style-type: none"> <li>o Tool Box</li> <li>o Code window</li> <li>o Design window</li> <li>o Project explorer</li> <li>o Properties window</li> <li>o Form Layout Window</li> </ul> </li> </ul>
1.5 Manipulates features of controls	<ul style="list-style-type: none"> <li>• Selection of controls               <ul style="list-style-type: none"> <li>o Labels</li> <li>o Text Boxes</li> <li>o Command buttons</li> </ul> </li> <li>• Setting properties               <ul style="list-style-type: none"> <li>o Name</li> <li>o Caption</li> <li>o Background Color</li> <li>o Font Color</li> <li>o Font Type, Style and Size</li> <li>o Alignment</li> </ul> </li> </ul>

1.6 Converts simple algorithms into programs.	<ul style="list-style-type: none"> <li>• Controls for data Input <ul style="list-style-type: none"> <li>o TextBox</li> </ul> </li> <li>• Controls for data output <ul style="list-style-type: none"> <li>o Label                      o TextBox</li> </ul> </li> <li>• Conversion process <ul style="list-style-type: none"> <li>o Coding                      o Testing</li> </ul> </li> </ul>
1.7 Uses constants and variables in programming.	<ul style="list-style-type: none"> <li>• Data Types <ul style="list-style-type: none"> <li>o Boolean   o Byte      o Integer</li> <li>o Single    o Double   o Currency</li> <li>o Date      o String</li> <li>o Object</li> </ul> </li> <li>• Variables and constants <ul style="list-style-type: none"> <li>o Naming   o Defining</li> </ul> </li> </ul>
1.8 Uses operators in programming	<ul style="list-style-type: none"> <li>• Types of Operators <ul style="list-style-type: none"> <li>o Arithmetic operators</li> <li>o Comparison operators</li> <li>o Logical operators And, Or, Not</li> <li>o Concatenation</li> </ul> </li> <li>• Operator Precedence</li> </ul>
1.9 Writes programs with objects and multiple forms	<ul style="list-style-type: none"> <li>• Calling Methods <ul style="list-style-type: none"> <li>o Show o Hide</li> </ul> </li> <li>• Events of control <ul style="list-style-type: none"> <li>o Single click   o Double click</li> <li>o Mouse move o Load</li> </ul> </li> <li>• Scroll Bar</li> <li>• Combo box</li> <li>• Check Box</li> <li>• Option Button</li> </ul>
1.10 Develops programs involving Single Condition	<ul style="list-style-type: none"> <li>• Selection control structures <ul style="list-style-type: none"> <li>o If-Then   o If-Then-Else</li> </ul> </li> </ul>
1.11 Develops programs involving Multiple Conditions.	<ul style="list-style-type: none"> <li>• Methods for using multiple conditions <ul style="list-style-type: none"> <li>o If-Then-Else-End If   o Select Case</li> </ul> </li> </ul>
1.12 Develops programs involving basic repetitions.	<ul style="list-style-type: none"> <li>• No. of repetitions known <ul style="list-style-type: none"> <li>o For-Next loop</li> </ul> </li> </ul>

1.13 Develops programs with different methods of repetitions	<ul style="list-style-type: none"> <li>• Repetition with <ul style="list-style-type: none"> <li>o Do-While</li> </ul> </li> <li>• Repetition with <ul style="list-style-type: none"> <li>o Do-Until</li> </ul> </li> </ul>
1.14 Develops programs using one dimensional arrays	<ul style="list-style-type: none"> <li>• Definition of one dimensional array</li> <li>• Array Operations <ul style="list-style-type: none"> <li>o Declaration</li> <li>o Accessing values</li> <li>o Assignment of values</li> <li>o Editing</li> </ul> </li> </ul>
1.15 Manages programs through sub routines	<ul style="list-style-type: none"> <li>• Sub Routine Techniques <ul style="list-style-type: none"> <li>o Functions</li> <li>o Procedures</li> </ul> </li> <li>• Scope of variables <ul style="list-style-type: none"> <li>o Private</li> <li>o Public</li> </ul> </li> </ul>
1.16 Controls programs using timer object	<ul style="list-style-type: none"> <li>• Timer Object <ul style="list-style-type: none"> <li>o Time Interval Property</li> <li>o Timer Event</li> </ul> </li> </ul>
1.17 Develops Programs to Retrieve data from databases	<ul style="list-style-type: none"> <li>• Tools for connecting databases to the application <ul style="list-style-type: none"> <li>o Data Environment</li> <li>o ADO Control</li> </ul> </li> <li>• Controls for viewing single record <ul style="list-style-type: none"> <li>o Text Box</li> <li>o Label</li> </ul> </li> </ul>
1.18 Updates records in databases	<ul style="list-style-type: none"> <li>• Methods in Data Environment <ul style="list-style-type: none"> <li>o Add method</li> <li>o Edit method</li> <li>o Delete method</li> </ul> </li> </ul>
1.19 Handles data through Data Grids in Visual Programming	<ul style="list-style-type: none"> <li>• Data Grid Control <ul style="list-style-type: none"> <li>o For viewing multiple records</li> <li>o For updating multiple records</li> </ul> </li> </ul>
1.20 Creates reports to retrieve data in databases.	<ul style="list-style-type: none"> <li>• Report Tool <ul style="list-style-type: none"> <li>o For designing report</li> <li>o For previewing report</li> <li>o For printing report</li> </ul> </li> </ul>
<b>2. Design and develops an information system to manage information in efficient and effective manner</b>	
2.1 Selects suitable systems for automation purposes	<ul style="list-style-type: none"> <li>• Definition of system</li> <li>• Components of a system <ul style="list-style-type: none"> <li>o input</li> <li>o process</li> <li>o output</li> </ul> </li> <li>• Information systems <ul style="list-style-type: none"> <li>o Importance of Information In decision making</li> <li>o Manual systems</li> <li>o Automated systems</li> </ul> </li> <li>• Organization as a system</li> <li>• Independent elements of a computer based information systems</li> </ul>

	<ul style="list-style-type: none"> <li>• Selecting a system to computerize</li> <li>o Problem definition</li> <li>o User requirements</li> <li>o System boundary</li> <li>o Resource limits</li> <li>o Feasibility study</li> <li>o Technical feasibility</li> <li>o Operational feasibility</li> <li>o Economical feasibility</li> </ul>
2.2 Analyses systems, selected for automation	<ul style="list-style-type: none"> <li>• Requirements of systems</li> <li>• Detailed operations of the system</li> </ul>
2.3 Designs and develops computerized systems for analyzed manual systems	<ul style="list-style-type: none"> <li>• Interface Design</li> <li>• Database Design</li> <li>• Selecting a Programming Language</li> <li>• Coding</li> </ul>
2.4 Implements and tests for debugging of developed systems	<ul style="list-style-type: none"> <li>• Testing and debugging the system for errors</li> <li>• Implements the new system <ul style="list-style-type: none"> <li>o Direct Implementation</li> <li>o Parallel Implementation</li> <li>o Phase Implementation</li> </ul> </li> </ul>
2.5 Maintenance systems for smooth and continuous service	<ul style="list-style-type: none"> <li>• Operational level error handling <ul style="list-style-type: none"> <li>o Hardware compatibility</li> <li>o Software compatibility</li> <li>o Incompatible data</li> </ul> </li> <li>• Make changes to the system when required <ul style="list-style-type: none"> <li>Adding new user requirements <ul style="list-style-type: none"> <li>o Expansion of the organization</li> <li>o Availability of New technology</li> </ul> </li> </ul> </li> </ul>
<b>3. Uses Internet for Effective Information Search and Communication</b>	
3.1 Uses Internet to access information	<ul style="list-style-type: none"> <li>• Introduction to Internet</li> <li>• Internet Services</li> <li>• Web site</li> <li>• Web page</li> <li>• IP address/Domain name</li> <li>• Search engines</li> </ul>
3.2 Communicates using email	<ul style="list-style-type: none"> <li>• Email software</li> <li>• E-mail address</li> <li>• Domain name</li> <li>• Creating a free e-mailaccount</li> <li>• Sending and receiving mails</li> </ul>

3.3 Uses chat to exchange information	<ul style="list-style-type: none"> <li>• Chat categories</li> <li>• Free chat services</li> <li>• Video chat/Video Conferencing <ul style="list-style-type: none"> <li>o Components (Web cam, Headset)</li> <li>o Advantages and concerns</li> </ul> </li> </ul>
<b>4. Develops Multimedia contents to express ideas effectively.</b>	
4.1 Creates effective still graphics using suitable graphic software.	<ul style="list-style-type: none"> <li>• Integrated development environment <ul style="list-style-type: none"> <li>o Tools options bar, o Tool box,</li> <li>o Drawing area, o Palettes</li> </ul> </li> <li>• Properties of a canvas <ul style="list-style-type: none"> <li>o Creating</li> </ul> </li> <li>o Setting properties <ul style="list-style-type: none"> <li>▪ Name      ▪ Preset size      ▪ Width</li> <li>▪ Height      ▪ Resolution</li> <li>▪ Mode</li> </ul> </li> <li>Contents</li> <li>• Use of toolbox. <ul style="list-style-type: none"> <li>o Elliptical Marquee Tool o Move Tool</li> <li>o Lasso Tool o Crop Tool</li> <li>o Brush Tool o Clone Stamp Tool</li> <li>o Eraser Tool o Paint Bucket Tool</li> <li>o Horizontal Type Tool</li> <li>o Custom Shape Tool</li> <li>o Setting background and foreground color.</li> </ul> </li> <li>• Handling layers <ul style="list-style-type: none"> <li>o Concepts of layers.</li> <li>o Operations of layers.</li> </ul> </li> <li>• Display and Hide layers <ul style="list-style-type: none"> <li>▪ Setting opacity      ▪ Setting fill</li> <li>▪ Creating      ▪ Deleting</li> <li>▪ Duplication      ▪ Setting the order</li> <li>▪ Setting layer style.      ▪ Drop shadow</li> <li>▪ Inner shadow      ▪ Stroke</li> </ul> </li> <li>• Manipulations of images. <ul style="list-style-type: none"> <li>o Cut and paste o Copy and paste</li> <li>o Cropping o Feather effect</li> <li>o Cloning</li> </ul> </li> <li>• File Operations <ul style="list-style-type: none"> <li>o Opening images o Saving images</li> </ul> </li> </ul>
4.2 Creates effective 2D animations using suitable 2D animations software	<ul style="list-style-type: none"> <li>• Components of working area <ul style="list-style-type: none"> <li>o Stage</li> </ul> </li> <li>• Layers <ul style="list-style-type: none"> <li>o Insertion o Deletion</li> <li>o Renaming</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• Frames <ul style="list-style-type: none"> <li>o Blank frame      o Key frame</li> <li>o Blank key frame</li> </ul> </li> <li>• Property inspector <ul style="list-style-type: none"> <li>o Basic Tools      o Arrow Tool</li> <li>o Text Tool      o Oval Tool</li> <li>o Rectangle Tool      o Eraser Tool</li> <li>o Free Transform Tool</li> </ul> </li> <li>• Animation types <ul style="list-style-type: none"> <li>o Frame-by-Frame</li> <li>o Shape Tweening</li> <li>o Motion Tweening</li> </ul> </li> <li>• File operations <ul style="list-style-type: none"> <li>o Creating      o Saving</li> <li>o Opening</li> <li>o Publishing</li> </ul> </li> </ul>
4.3 Creates Audio contents using suitable sound editing software	<ul style="list-style-type: none"> <li>• Handling sound files <ul style="list-style-type: none"> <li>o Recoding      o Saving</li> <li>o Editing <ul style="list-style-type: none"> <li>▪ Deletion of part of the file</li> <li>▪ Mixing of sound files</li> </ul> </li> </ul> </li> <li>• Addition of special effects <ul style="list-style-type: none"> <li>o Changing Volume</li> <li>o Changing the speed of play</li> <li>o Addition of echo</li> <li>o Reversing of sound</li> </ul> </li> </ul>
4.4 Effectively integrates multimedia contents	<ul style="list-style-type: none"> <li>• Integration of background images with animations</li> <li>• Integration of sound with animations</li> </ul>
<b>5. Develops simple websites incorporating Multimedia Technology.</b>	
5.1 Structures information for development of websites	<ul style="list-style-type: none"> <li>• Components of a web site <ul style="list-style-type: none"> <li>o Home Page      o Linked pages</li> </ul> </li> <li>• Text organization techniques <ul style="list-style-type: none"> <li>o Formats      o Columns      o Lists</li> <li>o Tables</li> </ul> </li> <li>• Reasons for integrating multimedia</li> <li>• Reasons for mouse pointer changes</li> <li>• Links</li> <li>• Ethical issues in provision of information <ul style="list-style-type: none"> <li>o Copyrights      o Harmless and moral.</li> </ul> </li> </ul>

5.2 Develops web sites using web development tools	<ul style="list-style-type: none"> <li>• Web authoring tools <ul style="list-style-type: none"> <li>o Text Formatting</li> <li>o Multimedia Integration</li> <li>o Hyperlinks</li> </ul> </li> <li>o Page Layout</li> </ul>
5.3 Develops simple web sites using HTML	<ul style="list-style-type: none"> <li>• Feature of HTML</li> <li>• HTML Tags <ul style="list-style-type: none"> <li>o Text Format</li> <li>o Tables</li> <li>o Hyperlinks</li> </ul> </li> <li>o Lists</li> <li>o Graphics</li> <li>• Differences between HTML and XML</li> </ul>
5.4 Demonstrates preparedness to publish web sites	<ul style="list-style-type: none"> <li>• Internet Service Providers for Web Publishing <ul style="list-style-type: none"> <li>o Fee levying</li> <li>o Non Fee Levying</li> </ul> </li> <li>• Requirements for Web Publishing <ul style="list-style-type: none"> <li>o Web server</li> <li>o Internet Protocol</li> <li>o Domain names</li> <li>o URLs</li> </ul> </li> </ul>
<b>6. Compares and contrasts benefits and issues related to ICT in society</b>	
6.1 Investigates the contribution of ICT to the health services	<ul style="list-style-type: none"> <li>• ICT in Health services</li> <li>• Tele Medicine <ul style="list-style-type: none"> <li>o Tele monitoring</li> <li>o Tele videoconferencing</li> </ul> </li> <li>• Computer controlled medical equipment <ul style="list-style-type: none"> <li>o Computer Axial Tomography (CAT) scanner</li> <li>o Magnetic Resource Image(MRI)</li> <li>o Electroencephalograph (EEG)</li> </ul> </li> <li>• Maintenance of medical history records. <ul style="list-style-type: none"> <li>o Diagnosis</li> <li>o Medication</li> <li>o Test reports</li> </ul> </li> </ul>
6.2 Investigates the contribution of ICT to education	<ul style="list-style-type: none"> <li>• ICT in Education</li> <li>• Learning and teaching <ul style="list-style-type: none"> <li>o Computer Assisted Learning(CAL)</li> <li>o eLearning</li> </ul> </li> <li>• Learning Management System</li> <li>• School Management Information System</li> </ul>

<p>6.3 Investigates the contribution of ICT to agriculture</p>	<ul style="list-style-type: none"> <li>• Computer controlled agricultural equipment <ul style="list-style-type: none"> <li>o Green house</li> </ul> </li> <li>• Information searching on agriculture</li> <li>• Virtual competitive market for agricultural products</li> <li>• Optimization of agricultural productivity <ul style="list-style-type: none"> <li>o Detection and control of pests</li> <li>o Optimization of fertilizer use</li> <li>o Weather prediction</li> </ul> </li> </ul>
<p>6.4 Investigates the contribution of ICT to industries</p>	<ul style="list-style-type: none"> <li>• ICT in Industries</li> <li>• Computer Aided Design(CAD) and Computer Aided Manufacture (CAM)</li> <li>• Robotics</li> <li>• Computerized machines in production</li> </ul>
<p>6.5 Explores the contribution of ICT to Business</p>	<ul style="list-style-type: none"> <li>• On line shopping</li> <li>• On line Share market transactions</li> <li>• Advertising</li> </ul>
<p>6.6 Explores the contribution of ICT to Entertainment</p>	<ul style="list-style-type: none"> <li>• Movies and songs</li> <li>• Games</li> <li>• Simulations</li> </ul>
<p>6.7 Assesses issues related to ICT with respect to ethical and legal aspects</p>	<ul style="list-style-type: none"> <li>• Legal Issues <ul style="list-style-type: none"> <li>o Software Piracy    o Software theft</li> <li>o Unauthorized access to systems</li> <li>o Copyright            o Patent</li> </ul> </li> <li>• Ethical issues</li> </ul>