

Government of Pakistan

**National Vocational and Technical Training Commission**

**Prime Minister Hunarmand Pakistan Program,  
"Skills for All"**



**Course Contents / Lesson Plan**

**Course Title:** Data Science

**Duration:** 6 Months

<b>Trainer Name</b>	
<b>Course Title</b>	<b>Data Science</b>
<b>Objective of Course</b>	<p><b>Employable skills and hands on practice for Web Development, Graphic Designing and Mobile App Development</b></p> <p>The aim for the team of staff responsible for delivery of the advanced IT curriculum is to provide knowledge and develop skills related to the IT. The course will allow participants to gain a comprehensive understanding of all the aspects. It will also develop the participant’s ability to act in a professional and responsible manner.</p> <p>Teaching staff will provide the technical knowledge and abilities required to solve tasks and problems that are goal-oriented. They will use participant-centered, practically oriented methods. They will also develop a program of practical assessment that reflects the learning outcomes stated in the curriculum. Trainees of the IT curriculum will also develop their willingness and ability as individuals to clarify issues, as well as think through and assess development opportunities.</p> <p>Teaching staff will also support trainees in developing characteristics such as self-reliance, reliability, responsibility, a sense of duty and a willingness and ability to criticize and accept criticism well and to adapt their future behavior accordingly.</p> <p>Teaching staff also use the IT curriculum to address the development of professional competence. Trainees will acquire the ability to work in a professional environment.</p> <p>By the end of this course, the trainees should gain the following competencies:</p> <ul style="list-style-type: none"> <li>• Understanding of programming techniques</li> <li>• Design and structure of android based application databases</li> <li>• Design and structure of web-based applications</li> <li>• Design and coding skills</li> <li>• Integration with API’S</li> <li>• Problems Solving Skills</li> <li>• Threading</li> <li>• Web Based android application</li> <li>• Understanding of Graphics</li> <li>• Design and structure</li> </ul>

	<ul style="list-style-type: none"><li>• Texturing</li><li>• Rigging</li><li>• Editing</li><li>• Drawing</li><li>• Movements</li><li>• Modeling</li></ul>
--	--

<b>Learning Outcome of the Course</b>	<p>By the end of this course, the trainees should gain the following competencies:</p> <ul style="list-style-type: none"> <li>• Understanding of programming techniques</li> <li>• Design and structure of android based application databases</li> <li>• Design and structure of web-based applications</li> <li>• Design and coding skills</li> <li>• Integration with API'S</li> <li>• Problems Solving Skills</li> <li>• Threading</li> <li>• Web Based android application</li> <li>• Understanding of Graphics</li> <li>• Design and structure</li> <li>• Texturing</li> <li>• Rigging</li> <li>• Editing</li> <li>• Drawing</li> <li>• Movements</li> <li>• Modeling</li> </ul>
<b>Course Execution Plan</b>	<p>Total Duration of Course: <b>6 Months (26 Weeks)</b></p> <hr/> <p>Class Hours: <b>4 Hours per day</b></p> <hr/> <p><b>Theory: 20% Practical: 80%</b></p> <hr/> <p>Weekly Hours: <b>20 Hours Per week</b></p> <hr/> <p>Total Contact Hours: <b>520 Hours</b></p>
<b>Companies Offering Jobs in the respective trade</b>	<ol style="list-style-type: none"> <li>1. Upwork</li> <li>2. Freelancing</li> <li>3. Fiverr</li> <li>4. Government Institutes</li> <li>5. Software Houses</li> <li>6. Crossover</li> <li>7. All Private Institutes who are managing software</li> </ol>
<b>Job Opportunities</b>	<p>All over the world there is a high demand in the Information Technology industry for developers in various field such as mobile application developer, web developer and graphic designer. Smartphone have brought about revolution; Animation technology has come a long way since the early days of hand-drawn cartoons. Nowadays you will find websites and apps on everything. This</p>

	<p>increase in usage of websites, apps android smart devices has created new opportunities for all to earn big and make a career out of this field. With the help of this course, we will be able to give technical trainings of Information Technology to our youth. There are also opportunities for start-up entrepreneurship due to the high demand in the market in following designated jobs;</p> <ul style="list-style-type: none"> <li>• Software Engineers</li> <li>• Mobile App Developers</li> <li>• DBAs</li> <li>• Web Developers</li> <li>• Network Administrator</li> <li>• IT Support Officer</li> <li>• Manager / Assistant Manager IT</li> </ul>
<b>No of Students</b>	25
<b>Learning Place</b>	Classroom / Lab
<b>Instructional Resources</b>	<p><b>Development Platform:</b></p> <ul style="list-style-type: none"> <li>• <a href="https://github.com/">https://github.com/</a> ,</li> <li>• <a href="https://firebase.google.com/">https://firebase.google.com/</a>,</li> <li>• <a href="https://developer.android.com/studio">https://developer.android.com/studio</a>,</li> <li>• <a href="https://visualstudio.microsoft.com/">https://visualstudio.microsoft.com/</a>,</li> <li>• <a href="https://getbootstrap.com/">https://getbootstrap.com/</a><a href="https://laravel.com/">https://laravel.com/</a>,</li> <li>• <a href="https://jquery.com/">https://jquery.com/</a></li> <li>• <a href="https://www.oracle.com/index.html">https://www.oracle.com/index.html</a>, <a href="https://flutter.dev/doc">https://flutter.dev/doc</a></li> </ul> <p><b>Learning Material:</b></p> <ul style="list-style-type: none"> <li>• <a href="https://www.w3schools.com/">https://www.w3schools.com/</a></li> <li>• <a href="https://deitel.com/other-books/">https://deitel.com/other-books/</a></li> <li>• <a href="https://angularjs.org/">https://angularjs.org/</a></li> <li>• <a href="https://www.youtube.com/c/fukatsoft1">https://www.youtube.com/c/fukatsoft1</a></li> <li>• <a href="http://learnopenerp.blogspot.com/">http://learnopenerp.blogspot.com/</a></li> </ul>

**Course Outline:**

Scheduled Week	Module Title	Learning Units	Remarks
Week 1	➤ Introduction	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b></li> <li>• <b>Course Introduction</b></li> <li>• <b>Success stories</b></li> <li>• <b>Job market</b></li> <li>• <b>Course Applications</b></li> <li>• <b>Institute/work ethics</b></li> <li>• Introduction to World Wide Web</li> <li>• Web Generations</li> <li>• Compare Static websites with Dynamic websites</li> <li>• Architecture of static and dynamic Webpages</li> <li>• Different types of websites</li> <li>• Different web threats</li> <li>• What is shopping carts and ecommerce?</li> <li>• Website Designing</li> <li>• Types of Design</li> <li>• Difference between web design and web development</li> </ul>	
Week 2	<p style="text-align: center;"><b><u>Module -1</u></b></p> <p><b>Chapter 1-</b> Introduction</p>	<ul style="list-style-type: none"> <li>• Functional and non-functional requirements of a Website</li> <li>• Website designing using Client-Side Scripting Languages</li> <li>• Write HTML code for a Website</li> <li>• HTML concepts</li> <li>• HTML Tag vs. Element</li> <li>• Nested HTML Elements</li> <li>• Core Attributes</li> <li>• Generic Attributes</li> <li>• HTML Formatting</li> <li>• Grouping Content</li> <li>• HTML Links</li> <li>• HTML Head Element</li> <li>• HTML Style Element</li> <li>• HTML Link Element</li> <li>• Viewport Setting</li> <li>• HTML Table</li> <li>• HTML Lists</li> <li>• Block Level Element vs Inline Element</li> </ul>	

		<ul style="list-style-type: none"> <li>• HTML Layout Elements</li> <li>• HTML Layout Techniques</li> <li>• HTML Forms</li> <li>• Forms Controls</li> <li>• HTML Iframe</li> <li>• HTML5 Input Types</li> <li>• Multimedia Formats</li> <li>• Playing Videos in HTML</li> </ul>	
<b>Week 3</b>	<b>Chapter 2</b> Frontend Development –Part 2	<ul style="list-style-type: none"> <li>• What is CSS?</li> <li>• CSS Versions</li> <li>• CSS Syntax</li> <li>• Selector Types</li> <li>• Inclusion</li> <li>• CSS Rules Overriding</li> <li>• CSS Comments</li> <li>• Colors</li> <li>• Background</li> <li>• Fonts</li> <li>• Text</li> <li>• Image</li> <li>• Links</li> <li>• Padding</li> <li>• Dimensions</li> <li>• Positioning</li> <li>• Floating</li> <li>• Round Corners</li> <li>• Border Image</li> <li>• Multi Background</li> <li>• Gradients</li> <li>• Shadow</li> </ul>	
<b>Week 4</b>	<b>Chapter 3</b> Frontend Development - Part 3	<ul style="list-style-type: none"> <li>• Introduction to Bootstrap3</li> <li>• Introduction to Bootstrap4</li> <li>• BS Grid Basic</li> <li>• BS Typography</li> <li>• BS Tables</li> <li>• BS Images</li> <li>• BS Jumbotron</li> <li>• BS Alerts</li> <li>• BS Buttons</li> <li>• BS Pagination</li> <li>• BS List Groups</li> <li>• BS Dropdowns</li> <li>• BS Collapse</li> <li>• BS Tabs/Pills</li> </ul>	

		<ul style="list-style-type: none"> <li>• BS Navbar</li> <li>• BS Forms</li> <li>• BS Inputs</li> <li>• BS Carousel</li> </ul>	
<b>Week 5</b>	<b>Chapter 4</b> Frontend Development - Part 4	<ul style="list-style-type: none"> <li>• What is JavaScript?</li> <li>• Advantages of JavaScript</li> <li>• Limitations of JavaScript</li> <li>• JavaScript Development Tools</li> <li>• Syntax</li> <li>• JavaScript Outputs</li> <li>• Comments in JavaScript</li> <li>• Variables</li> <li>• Data Types</li> <li>• Variable Scopes</li> <li>• Variable Names</li> <li>• Reserved Words</li> <li>• What is an Operator?</li> <li>• Arithmetic Operators</li> <li>• Comparison Operators</li> <li>• Logical Operators</li> <li>• Bitwise Operators</li> <li>• Assignment Operators</li> <li>• Miscellaneous Operators</li> <li>• If-Else Statement</li> <li>• Flow Chart of if-else</li> <li>• Syntax</li> <li>• Series of if-else</li> <li>• The for Loop</li> <li>• Flow Chart</li> <li>• Syntax</li> <li>• While Loop</li> <li>• Flow Chart</li> <li>• Syntax</li> <li>• Do-While Loop</li> <li>• Switch case</li> <li>• Flow Chart</li> <li>• Syntax</li> <li>• Loop Control</li> <li>• Break Statement</li> <li>• JQuery</li> <li>• Flow Chart</li> <li>• The Continue Statement</li> <li>• Using Labels to Control the Flow</li> <li>• For-In Loop</li> </ul>	



		<ul style="list-style-type: none"> <li>• Syntax</li> </ul> <p><b>Function</b></p> <ul style="list-style-type: none"> <li>• Syntax</li> <li>• Calling a Function</li> <li>• Function Parameters</li> <li>• The return Statement</li> <li>• Nested Functions</li> <li>• Function () Constructor</li> <li>• Function Literals</li> </ul> <p><b>Objects</b></p> <ul style="list-style-type: none"> <li>• Object Properties</li> <li>• Object Methods</li> <li>• User-Defined Objects</li> <li>• The new Operator</li> <li>• The Object () Constructor</li> <li>• Defining Methods for an Object</li> <li>• Defining Methods for an Object</li> <li>• Syntax</li> </ul> <p><b>Errors and Exceptions</b></p> <ul style="list-style-type: none"> <li>• Syntax Errors</li> <li>• Runtime Errors</li> <li>• Logical Errors</li> <li>• The try...catch Statement</li> <li>• The throw Statement</li> <li>• Finally, Statement</li> <li>• The onerror() Method</li> </ul> <p><b>Page Redirection</b></p> <ul style="list-style-type: none"> <li>• JavaScript Page Refresh</li> <li>• Auto Refresh</li> <li>• How Page Re-direction Works?</li> <li>• Dialog Box</li> <li>• Alert Dialog Box</li> <li>• Confirmation Dialog Box</li> <li>• Prompt Dialog Box</li> </ul> <p><b>jQuery and Its Plugins</b></p> <ul style="list-style-type: none"> <li>• How to use jQuery?</li> <li>• Local Installation</li> <li>• CDN Based Version</li> <li>• How to call a jQuery Library Functions?</li> <li>• jQuery slideDown() Method</li> <li>• jQuery slideToggle() Method</li> </ul>	
<b>Week 6</b>	<b>Chapter 5</b> Frontend Development - Part 5	<b>Angular JS</b> <ul style="list-style-type: none"> <li>• Template Designing</li> <li>• Theme Development</li> </ul>	

<p><b>Week 7</b></p>	<p><b>Chapter 6</b> Backend Development - Part 1</p>	<p><b>Basic Programing Concepts</b></p> <ul style="list-style-type: none"> <li>• Overview of PHP</li> <li>• Syntax Overview</li> <li>• Commenting PHP Code</li> <li>• PHP is whitespace insensitive</li> <li>• PHP is case sensitive</li> <li>• "Hello World" Script in PHP</li> </ul> <p><b>Variables&amp; Constants</b></p> <ul style="list-style-type: none"> <li>• Types of Variables</li> <li>• Variable Naming</li> <li>• PHP Local Variables</li> <li>• PHP Function Parameters</li> <li>• PHP Global Variables</li> <li>• PHP Static Variables</li> <li>• Constants</li> <li>• Differences between constants and variables</li> <li>• Valid and invalid constant names</li> <li>• PHP Magic constants</li> </ul> <p><b>Operators</b></p> <ul style="list-style-type: none"> <li>• Precedence of PHP Operators</li> <li>• Arithmetic Operators</li> <li>• Comparison Operators</li> <li>• Logical Operators</li> <li>• Assignment Operators</li> <li>• Conditional Operator</li> <li>• Incrementing/Decrementing</li> </ul>	
<p><b>Week 8</b></p>	<p><b>Chapter 7</b> Backend Development - Part 2</p>	<ul style="list-style-type: none"> <li>• Decision Making</li> <li>• The If.else Statement</li> <li>• The Switch Statement</li> </ul> <p><b>Loop Types</b></p> <ul style="list-style-type: none"> <li>• The for-loop statement</li> <li>• The while loop statement</li> <li>• The do.while loop statement</li> <li>• The foreach loop statement</li> <li>• The break statements</li> <li>• The continue statement</li> </ul> <p><b>String</b></p> <ul style="list-style-type: none"> <li>• String Concatenation Operator</li> <li>• Using the strlen() function</li> <li>• Using the strpos() function</li> </ul> <p><b>Array</b></p> <ul style="list-style-type: none"> <li>• Types of Array</li> <li>• Array Functions</li> </ul>	

		<ul style="list-style-type: none"> <li>• Sort Function for Array</li> </ul> <p><b>PHP Functions</b></p> <ul style="list-style-type: none"> <li>• Creating and Calling PHP Function</li> <li>• PHP Functions with Parameters</li> <li>• Passing Arguments by Reference</li> <li>• Passing Arguments by value</li> <li>• PHP Functions returning value</li> <li>• PHP OOP</li> </ul>	
<b>Week 9</b>	<b>Chapter 8</b> Backend Development - Part 3	<b>DBMS</b> <ul style="list-style-type: none"> <li>• MySQL -</li> <li>• DB Integration with PHP</li> </ul>	
<b>Week 10</b>	<b>Chapter 9</b> Backend Development - Part 4	<b>Introduction to MVC</b> <ul style="list-style-type: none"> <li>• Hands on practice on any MVC Framework</li> </ul>	
<b>Week 11</b>	<b>Chapter 10</b> Backend Development - Part 5	<ul style="list-style-type: none"> <li>• Project Development based on any MVC framework – Part -1</li> </ul>	
<b>Week 12</b>	<b>Chapter 11</b> Backend Development - Part 6	<ul style="list-style-type: none"> <li>• Project Development based on any MVC framework – Part-2</li> </ul>	
<b>Week 13</b>	<p><b><u>Module -2</u></b></p> <p><b>Chapter 1</b> Hands on practice on Illustrator and Photoshop-</p>	<ul style="list-style-type: none"> <li>• Opening Files, Documents and Navigation</li> <li>• Customizing the Photoshop Interface, Digital Image Essentials</li> <li>• Cropping, Straightening, and Adjusting Canvas Size, Layers</li> <li>• Learn about Color and Brush Essentials, Working with Layer Masks</li> <li>• Making Selections, Local Pixel Editing and Retouching, Blend Mode Essentials</li> <li>• Smart Object Essentials, Essential Transformations, Adjustment Layer Essentials</li> <li>• Essential Filters</li> <li>• Getting Started, Navigating, Working with Artboards</li> <li>• Artwork Basics, Working with Layers, Working with Objects</li> <li>• Working with Fills and Strokes, Working with Color</li> <li>• The Illustrator Appearance Panel, Drawing in Illustrator, working with the Pen Tool, Using Images in Illustrator</li> <li>• Working with Type, Creative Cloud and Illustrator, Printing and Exporting Artworks</li> </ul>	

<b>Week 14</b>	<b>Chapter 2</b> Graphic Designing - Part 2	<ul style="list-style-type: none"> <li>• Navigating the XD interface</li> <li>• Sharing your work in XD</li> <li>• Using artboards and grids</li> <li>• How Photoshop, Illustrator, and Sketch integrate with XD</li> <li>• Using the Repeat Grid feature</li> <li>• Working with the animation features in XD</li> <li>• Using voice interactions</li> <li>• Exporting content</li> <li>• The Interface, Getting Started, The Toolbox, Working with Fonts</li> <li>• Working with Objects, Working with Bitmaps, Useful Tools, Understanding Color</li> <li>• sPrinting, Workspace Customization</li> </ul>	
<b>Week 15</b>	<b>Mid-Term Assignment</b>		
<b>Week 16</b>	<p style="text-align: center;"><b><u>Module -3</u></b></p> <p><b>Chapter 1</b></p> Introduction to Mobile Application Development	<p><b>Introduction to Software</b></p> <ul style="list-style-type: none"> <li>• Software Tools Introduction</li> <li>• Java Development Kit Installation Overview</li> <li>• Install JDK 11 for Windows</li> <li>• Installing IntelliJ IDEA/Android Studio /Flutter</li> </ul> <p><b>Introduction to Compiler</b></p> Defining the Main Method <ul style="list-style-type: none"> <li>• Introduction to Android Studio</li> <li>• Introduction to the syntax</li> </ul>	
<b>Week 17</b>	<b>Chapter 2</b> Backend Development Techniques – Part-1	<p><b>Basic programing Concept</b></p> <ul style="list-style-type: none"> <li>• Variables</li> <li>• Starting out with Expressions</li> <li>• Primitive Types</li> <li>• Working with variables</li> <li>• Percentage</li> <li>• Ratio</li> <li>• More Examples</li> <li>• Casting in Java</li> <li>• Primitive Types Challenge</li> <li>• float and double Primitive Types</li> <li>• Floating Point Precision and a Challenge</li> <li>• The char and boolean Primitive Data Types</li> </ul> <p><b>Statements</b></p> <ul style="list-style-type: none"> <li>• Operators, Operands and Expressions</li> </ul>	

		<ul style="list-style-type: none"> <li>• If else statement</li> <li>• Else if statement</li> <li>• Logical and Operator</li> <li>• Logical OR Operator</li> </ul> <p><b>Statements</b></p> <ul style="list-style-type: none"> <li>• Assignment Operator VS Equals to Operator</li> <li>• Operator Precedence and Operator Challenge</li> <li>• Nested If</li> <li>• Nested if vs Logical operators</li> <li>• Switch statements</li> <li>• Cases in switch.</li> <li>• Default case.</li> <li>• Break statement.</li> <li>• If else vs switch</li> <li>• Switch Statements</li> <li>• Salary Example</li> <li>• Age Example</li> <li>• Vovels example</li> </ul> <p><b>Loops</b></p> <ul style="list-style-type: none"> <li>• While Loop</li> <li>• Range base tasks</li> <li>• Range vs loop</li> <li>• Problems based on maths range.</li> <li>• Starting Point</li> <li>• Ending Point</li> <li>• Conditional Statement</li> <li>• For loop</li> <li>• For loop vs while loop</li> <li>• Nested Loop</li> <li>• Do while loop</li> <li>• Reverse loop</li> <li>• Loops Example</li> <li>• Prime Numbers</li> <li>• Range base increments</li> <li>• Print characters using stars</li> </ul> <p><b>Arrays</b></p> <ul style="list-style-type: none"> <li>• Collection</li> <li>• Elements in array</li> <li>• Arrays and memory</li> <li>• How to access array elements</li> <li>• Array advantages over varibales</li> <li>• Arrays</li> <li>• Arrays and loops</li> </ul>	
--	--	---	--

		<ul style="list-style-type: none"> <li>• Efficient code with loops</li> <li>• Find Min Max from array</li> <li>• Iterate reverse array</li> <li>• Multidimensional Arrays</li> <li>• 2d Array</li> <li>• How to iterate 2d array</li> <li>• Array and matrix</li> <li>• Arrays Examples</li> <li>• Bubble sort</li> <li>• Selection sort.</li> </ul> <p><b>Functions</b></p> <ul style="list-style-type: none"> <li>• Return type</li> <li>• Function name</li> <li>• Parameters</li> <li>• Functions</li> <li>• Code Efficient</li> <li>• Reparative Code</li> <li>• Factorial Funtion</li> <li>• Functions Examples</li> <li>• Sample Diet function</li> <li>• How to call a funtion</li> </ul> <p><b>Access Modifier</b></p> <ul style="list-style-type: none"> <li>• Public</li> <li>• Private</li> <li>• Protected</li> <li>• Default</li> </ul> <p><b>Method overloading</b></p> <ul style="list-style-type: none"> <li>• Overloading wih parameters</li> <li>• Type of parameter</li> <li>• Number of parameters</li> <li>• Sequence of parameters</li> <li>• OOP</li> <li>• What is class</li> <li>• Attributes</li> <li>• Functions</li> <li>• Mapping real life objects.</li> </ul>	
<b>Week 18</b>	<b>Chapter 3</b> Backend Development Techniques Part-2	<p><b>OOP</b></p> <ul style="list-style-type: none"> <li>• What is class</li> <li>• Attributes</li> <li>• Functions</li> <li>• Mapping real life objects.</li> <li>• OOP</li> <li>• (.) operator</li> <li>• What is object</li> <li>• Creating object.</li> </ul>	

		<ul style="list-style-type: none"> <li>• Calling attributes and functions via object</li> <li>• Objects and Array of objects Objects</li> <li>• Storing Customers Data</li> <li>• Customer Model Class</li> <li>• Generating Data</li> <li>• Printing Data</li> <li>• Sorting Data</li> <li>• Constructor</li> <li>• this vs super</li> <li>• Contractor Overloading</li> <li>• Destructor</li> </ul> <p><b>Inheritance</b></p> <ul style="list-style-type: none"> <li>• Parent Class</li> <li>• Child Class</li> <li>• Extends Keyword</li> <li>• Calling's parent properties</li> <li>• Calling's parent functions</li> <li>• Advantages of Inheritance</li> </ul> <p><b>Polymorphism</b></p> <ul style="list-style-type: none"> <li>• Static Binding</li> <li>• Dynamic Binding</li> <li>• Advantages of polymorphism.</li> <li>• Complete OOP overview with Sample Project</li> </ul>	
<b>Week 19</b>	<b>Chapter 4</b> First Mobile App Development	<ul style="list-style-type: none"> <li>• Basics of Android (Introduction to Android Studio)</li> <li>• Installing Android Studio. (Sdk)</li> <li>• Setting up emulator.</li> <li>• Going through With Android Studio.(Explanation of IDE).</li> <li>• Packages , API Levels .</li> <li>• Creating Hello World App In Android</li> <li>• Creating First App.</li> <li>• Resources folders.</li> <li>• Gradle (app level, project level).</li> <li>• Manifest File.</li> </ul>	
<b>Week 20</b>	<b>Chapter 5</b> Introduction to Design	<p><b>Intro To Layouts</b></p> <ul style="list-style-type: none"> <li>• Relative Layout</li> <li>• Linear Layout</li> <li>• Frame Layout</li> <li>• Table Layout</li> <li>• Constraint Layout</li> <li>• ScrollView</li> <li>• Main Building Blocks (Part 1)</li> </ul>	

		<ul style="list-style-type: none"> <li>● Activities</li> <li>● Activity lifecycle</li> <li>● Customize BackPress Button</li> <li>● Intents</li> </ul> <p><b>Main Building Blocks (Part 2)</b></p> <ul style="list-style-type: none"> <li>● Launch Activity</li> <li>● Moving Between Activities</li> <li>● Transfer Data Between Activities</li> <li>● Activities Stack</li> </ul> <p><b>ListView and GridView</b></p> <ul style="list-style-type: none"> <li>● Simple ListView</li> <li>● Add Layout</li> <li>● Add data</li> <li>● Display in activity</li> <li>● Customize ListView</li> <li>● Add Model(Data plus model class)</li> <li>● Add controller(Adapter Class)</li> <li>● Add View(Activity or Fragment)</li> <li>● Customize ListView</li> <li>● Add OnItemClickListener</li> <li>● Select and implement functionality on every list</li> <li>● Send listItem data in new Activity</li> <li>● Display data on new Screen like Daraz orAliBaba.</li> </ul>	
<b>Week 21</b>	<p>Employable Project/Assignment (6 weeks i.e. 21-26) in addition of regular classes.</p> <p style="text-align: center;"><b>OR</b></p> <p>On job training ( 2 weeks)</p>	<ul style="list-style-type: none"> <li>● Guidelines to the Trainees for selection of students employable project like final year project (FYP)</li> <li>● Assign Independent project to each Trainee</li> <li>● A project based on trainee's aptitude and acquired skills.</li> <li>● Designed by keeping in view the emerging trends in the local market as well as across the globe.</li> <li>● The project idea may be based on Entrepreneur.</li> <li>● Leading to the successful employment.</li> <li>● The duration of the project will be 6 weeks</li> <li>● Ideas may be generated via different sites such as:  <a href="https://1000projects.org/">https://1000projects.org/</a>  <a href="https://nevonprojects.com/">https://nevonprojects.com/</a>  <a href="https://www.freestudentprojects.com/">https://www.freestudentprojects.com/</a></li> </ul>	



		<p><a href="https://technofizi.net/best-computer-science-and-engineering-cse-project-topics-ideas-for-students/">https://technofizi.net/best-computer-science-and-engineering-cse-project-topics-ideas-for-students/</a></p> <ul style="list-style-type: none"> <li>• Final viva/assessment will be conducted on project assignments.</li> <li>• At the end of session the project will be presented in skills competition</li> <li>• The skill competition will be conducted on zonal, regional and National level.</li> <li>• The project will be presented in front of Industrialists for commercialization</li> <li>• The best business idea will be placed in NAVTTC business incubation center for commercialization.</li> </ul> <p>-----</p> <p style="text-align: center;"><b>OR</b></p> <p><b>On job training for 2 weeks:</b></p> <ul style="list-style-type: none"> <li>• Aims to provide 2 weeks industrial training to the Trainees as part of overall training program</li> <li>• Ideal for the manufacturing trades</li> <li>• As an alternate to the projects that involve expensive equipment</li> <li>• Focuses on increasing Trainee's motivation, productivity, efficiency and quick learning approach.</li> </ul>	
<b>Week 22</b>	<b>Chapter 7</b>  Frontend Development for App	<p><b>Widgets</b></p> <ul style="list-style-type: none"> <li>• Buttons</li> <li>• Input Fields</li> <li>• Output Fields</li> <li>• Images etc</li> <li>• Handling Events.</li> </ul> <p><b>Fragments</b></p> <ul style="list-style-type: none"> <li>• Launch Fragment</li> <li>• Pass data using Bundle</li> <li>• Load fragment on click</li> <li>• Swipe Fragments</li> <li>• Activity vs Fragment</li> <li>• Fragment Lifecycle</li> <li>• Dependency on Activity</li> <li>• SeperateFrontEnd&amp;BackEnd</li> </ul> <p><b>Frontend Designing</b></p> <ul style="list-style-type: none"> <li>• Relative Layout for Placement</li> <li>• Linear Layout for responsiveness</li> <li>• ScrollView for infinite Scrolling</li> <li>• UI</li> </ul>	

		<ul style="list-style-type: none"> <li>● Multiple Files with one screen</li> <li>● Based on size</li> <li>● Based on orientation</li> <li>● UI for tablets devices</li> </ul> <p><b>Services</b></p> <ul style="list-style-type: none"> <li>● Services LifeCycle</li> <li>● Activity and service</li> <li>● Start Service</li> <li>● Stop Service</li> <li>● Register Services</li> </ul> <p><b>BroadCastRecievers</b></p> <ul style="list-style-type: none"> <li>● What is broadcast Reciver?</li> <li>● Register boradcast</li> <li>● Send notification</li> <li>● Send BroadCast</li> <li>● RecieveBroadCast</li> </ul>	
<b>Week 23</b>	<b>Chapter 8</b>  Backend Development Part -1	<p><b>Saving user information</b></p> <ul style="list-style-type: none"> <li>● SharedPreferences</li> <li>● Key Value Pair</li> <li>● Remove and clear funtions.</li> <li>● Counter Example.</li> <li>● Introducing SQLite</li> <li>● SQLiteOpenHelper and creating a database</li> <li>● Opening and closing a database</li> <li>● SQLite &amp; Paper DB 93</li> <li>● FireBase</li> <li>● Saving user information</li> <li>● Working with cursors Inserts, updates, deletes</li> </ul> <p><b>CRUD operation with local DB</b></p> <ul style="list-style-type: none"> <li>● Sample Login System using DB</li> <li>● Mapping and Location Based Services</li> <li>● Get API key</li> <li>● Add marker</li> <li>● Customize Marker</li> <li>● Latitude and longitude</li> <li>● Mapping and Location Based Services</li> <li>● Using Location Based Services</li> <li>● Using the Geocoder</li> <li>● Turn on location</li> <li>● Mapping and Location Based Services</li> <li>● Runtime permissions</li> <li>● Permissions in manifest</li> <li>● Current location retrieval</li> </ul> <p><b>Create Uber sample with storing location after</b></p>	

		<p><b>20 secs in DB</b></p> <ul style="list-style-type: none"> <li>● Embedding API's using PHP</li> <li>● Google Maps</li> <li>● Social Media Widgets</li> <li>● Payment Integration</li> </ul> <p><b>Json</b></p> <ul style="list-style-type: none"> <li>● Json (What is Json)</li> <li>● JSONArray,s and Json Objects .</li> <li>● First Look in json</li> </ul> <p><b>ArrayList In detail</b></p> <ul style="list-style-type: none"> <li>● Add</li> <li>● Clone</li> <li>● Get</li> <li>● Delete</li> </ul> <p><b>Parsing Json</b></p> <ul style="list-style-type: none"> <li>● Get data from online web</li> <li>● Parse data in readable form</li> <li>● Store data in Arraylist</li> <li>● JSON</li> <li>● Weather Api sample</li> <li>● Currency Api sample</li> <li>● Contacts Api sample</li> <li>● Prayer Api Sample</li> <li>● Store online data in database</li> <li>● Display Data in Listview from online source</li> </ul>	
<b>Week 24</b>	<b>Chapter 9</b> Backend Development Part -2	<p><b>Sensors</b></p> <ul style="list-style-type: none"> <li>● Working with sensors</li> <li>● Gravity Sensor</li> <li>● accelerometer sensor</li> <li>● Repositories (upload project on bitbucket)</li> <li>● Async</li> <li>● Webview</li> <li>● Exploring Libraries</li> <li>● What is Github?</li> <li>● Button Library</li> <li>● Image Zoom Library</li> <li>● Glide in detail</li> </ul> <p><b>Android Webview</b></p> <ul style="list-style-type: none"> <li>● Display website on android app.</li> <li>● Use website as an android app,</li> <li>● AsyncTask</li> </ul>	

		<ul style="list-style-type: none"> <li>Action on Start</li> <li>Action on Progress</li> <li>Action on complete</li> </ul> <b>Android Calendar Api</b> <ul style="list-style-type: none"> <li>Customize date and time</li> <li>Date: Year Month Day</li> <li>Time: Hour Minute Seconds.</li> <li>Customize Notifications</li> <li>Simple Notification</li> <li>Customize Notification</li> <li>Run app onclick notification</li> <li>Define controls using notification</li> </ul>	
<b>Week 25</b>	<b>Chapter 10</b> New Market Technology	<ul style="list-style-type: none"> <li>Hybrid apps</li> <li>Use of Libraries</li> <li>Final Projects</li> </ul>	
<b>Week 26</b>	Entrepreneurship and Final Assessment in project	<ul style="list-style-type: none"> <li>Job Market Searching</li> <li>Self-employment</li> <li>Freelancing sites</li> <li>Introduction</li> <li>Fundamentals of Business Development</li> <li>Entrepreneurship</li> <li>Startup Funding</li> <li>Business Incubation and Acceleration</li> <li>Business Value Statement</li> <li>Business Model Canvas</li> <li>Sales and Marketing Strategies</li> <li>How to Reach Customers and Engage CxOs</li> <li>Stakeholders Power Grid</li> <li>RACI Model, SWOT Analysis, PEST Analysis</li> <li>SMART Objectives</li> <li>OKRs</li> <li>Cost Management (OPEX, CAPEX, ROCE etc.)</li> <li>Final Assessment</li> </ul>	

#### List of Machinery / Equipment

Sr. No	Name of item as per curriculum	Quantity physically available at the training location
1	Computers Minimum Corei5 <ul style="list-style-type: none"> <li>LCD Display 17" with built in speakers</li> </ul>	25
2	Mobiles with Android OS	25

Plot no. 38, Kirthar Road, H-9 Islamabad  
051-9044250

3	DSL Internet Connection (Minimum 1 MB)	Available on every PC
4	<b>Accessories/Devices</b> <ul style="list-style-type: none"> <li>• Connectors</li> <li>• Multimedia</li> <li>• Printer (NW printer)</li> <li>• Audio/visual aid</li> <li>• White Board</li> <li>• Pin Board</li> <li>• Flip Chart Board</li> <li>• Hard copy of Training Material</li> <li>• Mobile Phones</li> </ul>	25 each
5	<b>Wires, data cables, power plugs, power supply</b>	For every PC
6	<b>UPS</b>	Available
7	<b>Generator / Solar Backup</b>	Available
8	<b>Air Conditioner (2 Tons)</b>	Available

### 1. Software List

Sr. No	Software Name
1.	MS Office 2016 (Installed on each PC)
2.	Operating System (Windows, Linux or other Operating Systems)
3.	Programming Languages including NetBeans, Android studio (Licensed
4.	Web Servers including IIS, Apache (Licensed software installed on each PC)
5.	Databases including MySQL, ERWIN (Licensed software installed on each PC)
6.	FTP Client including FileZilla, File Manager (Licensed software installed on each PC)
7.	Web hosting manager/control panel

8.	Web browser including Internet Explorer, Google Chrome, Mozilla Firefox, Netscape, Opera (installed on each PC)
9.	Firewall (each PC)
10.	Security scanning tools including Antivirus (each PC) Networking
11.	Designing Software: <ul style="list-style-type: none"> <li>• After Effects</li> <li>• Adobe Photoshop</li> <li>• CorelDraw</li> <li>• Character Animation</li> <li>• Illustrator</li> <li>• Adobe Premiere</li> <li>• MS Office</li> <li>• MS Visio</li> <li>• MySQL</li> <li>• NetBeans</li> <li>• Android Studio</li> </ul>

## 2. Minimum Qualification of Teachers / Instructor

The qualification of teachers / instructor of this course should be minimum **of bachelors in Computer science with minimum 3 years of development experience** in relevant trade.

- Bachelors of Computers Science / Networks (Hons)

## 3. Supportive Notes

### Teaching Learning Material

Books Name	Author
The Adobe Photoshop CC Book for Digital Photographers	Book by Scott Kelby
Internet & World Wide Web How to Program How to Program Series	Deitel and Deitel
Java for Programmers	Paul Deitel

An indispensable illustration book for any artist	James Gurney
Adobe Premiere Pro CC Classroom in a Book (2019 Release)	Kindle Edition
Adobe After Effects CC Classroom in a Book	Adobe Creative Team (Author)
Producing Independent 2D Character Animation: Making & Selling A Short Film (Focal Press Visual Effects and Animation)	Mark A. Simon (Author)
ATC (Advanced Training Consultants) Android Application Development	
New Horizons (Computer Learning Centers)	
Coursera android (Complete Android Course)	
FukatSoft Online Learning System	