**Course Description**

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| **COURSE TITLE** | **Scratch Programming** |
| **Student Lead** | Mustajab Malik |
| **For Question you can contact in:** | mustajabali2812@gmail.com |
| **Overview:** | Scratch makes it easy to create your own games, animations, music, art or applications. It’s the perfect way to learn programming because it takes away a lot of the complexity. That means you can focus on having great ideas and bringing them to life. |
| **Audience Profile** | The course is for every peer learner who are motivated to learn and develop a new skill. |
| **Course Objectives** | After completing this course, you will be able to:   * Design, build and share your own programs * Create addictive arcade games, quizzes and word games * Make computer-generated art * Paly your favorite music and compose your own tunes * Use variables, lists, loops broadcast and operators to create sophisticated software * Avoid common programming pitfalls and bugs |
| **Platform where you can take session** | Binary2meta |

**COURSE OUTLINE:**

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| **Introducing Scratch** | **Introduction to Scratch** |
| **Week 1** | * Introduction to the Scratch interface and tools * Basic concepts such as sprites, backdrops, and blocks * Creating a simple project, such as an interactive greeting card |
| **Session 2:** |
| * Creating your first program * Saving your projects * Opening Projects * Opening shared projects * Understanding coordinates |
| **Week 2** | **Animations and Sounds** |
| * Using built-in Scratch animations and sounds * Creating custom animations and sounds using sprites and the sound editor * Creating an animated story or game |
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| **Week 3** | **Variables and Conditionals** |
| * Character Animations * Animate a Character’s Cards * Move with Arrow Keys * Make a Character Jump * Switch Poses |
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| **Week 4** | **Loops and Lists** |
| * Introduction to loops and how to use them in Scratch * Using lists to store and manipulate data * Creating a project that uses loops and lists, such as a quiz game |
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| **Week 5** | **User Input and Control** |
| * Creating interactive projects that respond to user input * Introduction to event blocks, such as "when key pressed" * Creating a game or animation that responds to user input and control |
| **Week 6** | **Pen and Vector Graphics** |
| * Introduction to the pen tool and vector graphics in Scratch * Creating custom graphics and animations using the pen tool * Creating a project that uses the pen tool and vector graphics, such as a drawing or animation tool |
| **Week 7** | **Advanced Animation Techniques** |
| * Creating more complex animations using advanced techniques such as cloning and broadcast messaging * Creating a project that uses advanced animation techniques, such as a music video or animated short |
| **Week 8** | **Final Project** |
| * Students will choose a project of their choice and work on creating a complete project using the skills learned throughout the course * Instructor will provide guidance and feedback on the project. |
| **Week 9** | **Introduction to AI and Scratch** |
| * Introduction to AI and machine learning concepts * Overview of Scratch and its capabilities for AI-based game design * Creating a simple AI game, such as rock-paper-scissors, using basic AI algorithms * Introduction to data sets and supervised learning |
| **Week 10** | **Machine Learning with Scratch** |
| * Introduction to machine learning algorithms in Scratch, such as k-nearest neighbor and decision trees * Creating a game that uses machine learning algorithms to predict user input * Collecting and labeling data for training a machine learning model |
| **Week 11** | **Neural Networks in Scratch** |
| * Introduction to neural networks and deep learning concepts * Creating a simple neural network in Scratch using the pen tool and math blocks * Creating a game that uses a neural network to predict user input * Training a neural network using labeled data sets |
| **Week 12** | **Final Project** |
| * Students will choose a project of their choice and work on creating a complete project using the skills learned throughout the course, such as a game that uses a combination of machine learning algorithms and neural networks * Instructor will provide guidance and feedback on the project. |
| **Week 13** | **Robotics and Microcontroller Extensions** |
| * Introduction to the Robotics and Microcontroller extensions and their capabilities * Overview of different microcontrollers and how they can be used with Scratch * Creating a project that uses the Robotics extension to control a robot * Creating a project that uses the Microcontroller extension to control external hardware |
| **Week 14** | **Text Analysis and Translation Extensions** |
| * Introduction to the Text Analysis and Translation extensions and their capabilities * Creating a project that uses the Text Analysis extension to analyze and categorize text * Creating a project that uses the Translation extension to translate text into different languages |
| **Week 15** | **Game Development Extensions** |
| * Introduction to game development * Creating a simple game using the Arcade or Platformer extension * Introduction to the Multiplayer extension and its capabilities * Creating a multiplayer game using the Multiplayer extension |
| **Week 16** | **Advanced Text-to-Speech** |
| * Exploring advanced features of the Text-to-Speech * Creating a project that uses Text-to-Speech to generate speech from text inputted by the user * Using the Text-to-Speech extension to create a language learning project |