VGURU TECH ACADEMY

Beginner Coding - Scratch

Course Syllabus

Level: Beginner

Part 1: Course Description

This beginner course introduces young learners to the world of programming through Scratch. Focused on creativity and fun, students will learn basic programming concepts by creating simple animations and stories. They will explore the Scratch interface, learn to control sprites, add sounds, and understand basic loops and events. The course aims to develop foundational problem-solving skills and foster a love for coding through interactive and engaging activities.

Part 2: Student Learning Outcomes & Objectives

Student Learning Outcomes

- Understand basic programming logic
- Create simple animations and stories
- Develop basic problem-solving skills

Course Objectives

To introduce young learners to the basics of programming using Scratch, focusing on creativity and fundamental coding concepts.

Part 3: Topic Outline

Prerequisites

- Basic computer skills
- Ability to read and follow simple instructions

- ➔ Session 1: Getting to Know Scratch
  - ◆ Introduction to Scratch interface
  - ◆ Creating a Scratch account
- ➔ Session 2: Your First Scratch Project
  - ◆ Basic motion and sound commands
  - ◆ Creating a simple animation
- ➔ Session 3: Playing with Sprites and Backgrounds
  - ◆ Adding and editing sprites
  - ◆ Changing backgrounds
- ➔ Session 4: Introduction to Loops
  - ◆ Using repeat blocks
  - ◆ Creating simple loops
- ➔ Session 5: Adding Sound and Effects
  - ◆ Incorporating sound effects
  - ◆ Using visual effects
- ➔ Session 6: Events and Interaction
  - ◆ Understanding event blocks
  - ◆ Making sprites interact
- ➔ Session 7: Storytelling with Scratch
  - ◆ Creating a basic interactive story
  - ◆ Using dialogue and scenes
- ➔ Session 8: Show and Tell
  - ◆ Students present their projects
  - ◆ Review and feedback session

Level: Intermediate

Part 1: Course Description

Building on basic Scratch knowledge, this intermediate course delves into more complex programming concepts. Students will learn to use variables, and conditional logic, and create interactive games and stories. The course covers advanced motion commands, scorekeeping, and timers, and introduces broadcast messages for sprite communication. Emphasizing creative storytelling and game design, students will complete the course by developing their own interactive Scratch project.

Part 2: Student Learning Outcomes & Objectives

Student Learning Outcomes

- Develop interactive games and stories
- Understand and use variables and conditional statements
- Enhance creative and logical thinking skills

Course Objectives

To expand on the foundational Scratch skills, introducing more complex programming concepts and encouraging creative storytelling and game design.

Part 3: Topic Outline

Prerequisites

- Completion of Beginner Level or basic Scratch experience
- Ability to create simple Scratch projects

➔ Session 1: Advanced Motion and Sensing
- ◆ Complex motion commands
- ◆ Sensing and responding to the environment

➔ Session 2: Variables and Scores
- ◆ Introduction to variables
- ◆ Creating and using score counters

➔ Session 3: Conditional Logic
- ◆ If-then and if-then-else blocks
- ◆ Making decisions in games

➔ Session 4: Broadcast Messages
- ◆ Using broadcast for communication between sprites
- ◆ Creating multi-level games

➔ Session 5: Timers and Randomness
- ◆ Implementing timers
- ◆ Using random numbers

➔ Session 6: Cloning Sprites
- ◆ Understanding and using clones
- ◆ Managing multiple sprites

➔ Session 7: Game Design Principles
- ◆ Basic game design concepts
- ◆ Planning and designing a game

➔ Session 8: Intermediate Project
- ◆ Developing an interactive game
- ◆ Presentation and peer review

Level: Advanced

Part 1: Course Description

Designed for students with a solid understanding of Scratch, this advanced course focuses on sophisticated programming techniques and complex project development. Students will explore advanced animation, multiplayer game design, basic AI concepts, and data structures. The course also introduces integration with external devices and advanced debugging techniques. Culminating in a capstone project, students will demonstrate their comprehensive Scratch skills by developing and presenting a complex game or animation.

Part 2: Student Learning Outcomes & Objectives

Student Learning Outcomes

- Master advanced Scratch features
- Develop complex games and animations
- Understand the principles of good design and user experience

Course Objectives

To refine and expand Scratch skills, focusing on advanced programming concepts and complex project development.

Part 3: Topic Outline

Prerequisites

- Completion of Intermediate Level or strong understanding of Scratch basics
- Experience in creating Scratch projects with variables and logic

- Session 1: Complex Algorithms in Scratch
  - Advanced loops and conditional logic
  - Problem-solving with algorithms
- Session 2: Advanced Animation Techniques
  - Creating sophisticated animations
  - Storyboarding and planning
- Session 3: Multiplayer Game Design
  - Designing games for multiple players
  - Understanding game mechanics
- Session 4: Data Structures
  - Lists and arrays in Scratch
  - Managing complex data
- Session 5: Artificial Intelligence in Scratch
  - Basic AI concepts
  - Implementing simple AI in games
- Session 6: Integration with External Devices
  - Connecting Scratch to hardware (like Makey Makey)
  - Interactive physical computing projects
- Session 7: The Art of Debugging
  - Advanced debugging techniques
  - Testing and refining projects
- Session 8: Capstone Project
  - Developing a comprehensive Scratch project
  - Final presentation and critique