**Course Title**:

**"AI Innovators: Build Smart Apps with MIT App Inventor"**  
*(Grades 9-10 | 4 Weeks | 12 Sessions | Prerequisite: Basic coding familiarity)*

**Course Outcomes**

By the end of this course, students will:

1. Understand **core AI concepts** (ML, NLP, computer vision) through apps.
2. Build **5+ AI-powered apps** using MIT App Inventor’s AI extensions.
3. Apply **ethical AI principles** to real-world problems.
4. Develop a **final project** addressing a community need.

**Weekly Breakdown**

**Week 1: Introduction to AI & Simple Apps**

**Objective**: Explore AI basics and build foundational apps.

* **Session 1**: "What is AI?"
  + *Activity*: Demo AI tools (Google Quick Draw, Teachable Machine).
  + *Project*: "AI Quiz App" (Q&A about AI ethics).
* **Session 2**: "Chatbot Buddy"
  + *Skills*: Lists, conditionals, simple NLP.
  + *Project*: Rule-based chatbot (e.g., homework helper).
* **Session 3**: "Voice Assistant"
  + *Skills*: Speech recognition (TextToSpeech/SpeechRecognizer).
  + *Project*: Voice-controlled joke teller.

**Assessment**: Debug an AI app with missing logic.

**Week 2: Machine Learning & Vision**

**Objective**: Train and integrate ML models.

* **Session 4**: "Image Classifier"
  + *Skills*: Personal Image Classifier extension.
  + *Project*: "Emotion Detector" (happy/sad/angry).
* **Session 5**: "Object Identifier"
  + *Skills*: Cloud-based ML (e.g., AWS Rekognition API).
  + *Project*: "Smart Camera" app labeling objects.
* **Session 6**: "AI Art Generator"
  + *Skills*: DALL-E API integration (simplified).
  + *Project*: App that generates art from text prompts.

**Assessment**: Accuracy test of student-trained classifiers.

**Week 3: Advanced AI & Data**

**Objective**: Work with databases and complex AI logic.

* **Session 7**: "AI Tutor"
  + *Skills*: CloudDB, adaptive learning.
  + *Project*: Flashcard app that adjusts difficulty.
* **Session 8**: "Language Translator"
  + *Skills*: Translation API (Google Cloud).
  + *Project*: Text translator with voice input/output.
* **Session 9**: "AI for Social Good"
  + *Skills*: Problem-solving with AI.
  + *Project*: Brainstorm apps (e.g., waste classifier).

**Assessment**: Peer review of app usability.

**Week 4: Final Project & Ethics**

**Objective**: Build a capstone project and discuss AI ethics.

* **Session 10**: "Ethics Workshop"
  + *Activity*: Debate biases in AI (e.g., facial recognition).
* **Session 11-12**: "Build & Present"
  + *Deliverable*: Functional AI app (e.g., mental health chatbot, study assistant).
  + *Presentation*: Demo to class + explain ethical considerations.

**Assessment**: Rubric for innovation, technical depth, and ethics reflection.

**Key Tools & Resources**

* **MIT App Inventor AI Extensions**:
  + [Personal Image Classifier](https://appinventor.mit.edu/explore/ai-with-mit-app-inventor)
  + [CloudDB](https://appinventor.mit.edu/explore/cloud-db)
* **APIs**: Google Cloud Translation, AWS Rekognition (simplified via tutorials).
* **Ethics Materials**: MIT’s "AI & Society" case studies.

**Adaptations for Younger Learners**

* **Simplified APIs**: Use pre-trained models instead of live APIs.
* **Pair Programming**: Team advanced learners with beginners.
* **Unplugged Activities**: Role-play AI decision-making (e.g., "Should a self-driving car prioritize passengers or pedestrians?").

**Sample Session Plan (Week 2, Session 4)**

**Objective**: Build an emotion-detection app.

1. **Hook (10 mins)**: Show TikTok filters; discuss how they detect faces.
2. **Direct Instruction (15 mins)**: Train a model with 3 emotions (using MIT’s Image Classifier).
3. **Guided Practice (20 mins)**: Build UI with camera + emotion label.
4. **Independent Practice (10 mins)**: Add sound effects for each emotion.
5. **Wrap-up (5 mins)**: Discuss limitations (e.g., accuracy with masks).

**Teacher Support**

* **Cheat Sheets**: Common errors in AI extensions.
* **Extension Ideas**:
  + Advanced: Integrate ChatGPT API for dynamic chatbots.
  + Creative: AI-generated music apps.