Applied learning curriculum for the 3MTT programme

SOFTWARE DEVELOPMENT

Overview: Learn the full software development lifecycle.

Key Learning Outcomes

- Writing clean and efficient code in front and back-end programming languages (React and JavaScript) as well as developing competencies in basic database setup.
- Deployment of web applications.
- Understanding agile and simple DevOps methodologies.
- Collaborating using version control and CI/CD.

Training Methodology

Coding challenges, group projects, and agile development.

Duration

12 Weeks

Applied Learning Course Content

Weekly Tasks and Individual Project
Special 3MTT Seminars/Workshops
Group Projects Options
Mode of Delivery and Program Structure

**Weekly Tasks and Individual Project for Software Development
Project: Task Tracker Application**

Week 1-2: Introduction to Web Development and Version Control

Objective: Set up a basic personal portfolio page.

Tasks

- Create an HTML file with basic personal information (name, introduction).
- Style the HTML using CSS for a visually appealing layout.
- Initialize a Git repository for version control.
- Commit and push your HTML and CSS files to GitHub.
- Review and make improvements to your portfolio based on feedback.
- Learn basic Git commands (commit, push, pull).
- Explore and customize your portfolio with additional sections (projects, skills).
- Add links to your social profiles.

Week 3-4: Frontend Development with React

Objective: Build an interactive to-do list application using React.

Tasks

- Set up a React application using create-react-app.
- Create a new component for displaying tasks.
- Implement a state to manage tasks within the component.
- Display a list of tasks dynamically.
- Add a form component to input new tasks.
- Implement the ability to add tasks to the list.
- Allow users to mark tasks as completed.
- Explore and apply basic styling to your React components.

Week 5-6: Backend Development with Node.js and Express

Objective: Develop a basic Express API for managing tasks.

Tasks

- Initialize a Node.js project using npm init.
- Set up an Express server.
- Create a basic route for tasks in your Express server.
- Create a simple JSON file to act as a database for tasks.
- Connect your Express server to the JSON database.
- Implement basic CRUD operations for tasks (Create, Read, Update, Delete).

Week 7-8: Database Integration and Full-Stack Development

Objective: Integrate a database for persistent task storage.

Tasks

- Choose a simple database (SQLite).
- Connect your Express server to the chosen database.
- Enhance CRUD operations to interact with the database.
- Integrate the database into your React application.
- Implement basic error handling for database interactions.
- Continue styling improvements for a better user interface.

Week 9-10: Advanced Frontend Development and State Management

Objective: Implement advanced features using React Context.

Tasks

- Learn about advanced React concepts (Hooks, Context API).
- Implement React Context for state management across components.

- Introduce advanced features to your application (prioritization, due dates).
- Enhance user interface and user experience.
- Implement and customize error handling for a smoother user experience.

Week 11-12: Deployment, Testing, and Capstone Project

Objective: Deploy the Task Tracker application and present a final project.

Tasks

- Deploy your Task Tracker application to a platform like Netlify.
- Write basic tests using Jest and React Testing Library.
- Prepare and present your project, showcasing the application and discussing the technologies used.
- Gather feedback and insights from peers and mentors.
- Reflect on the learning journey and plan for future projects.

Special 3MTT Seminars (Weekly)

1. Introductory Seminar
2. 3MTT Courses Fundamentals Seminar: Digital Creativity: Exploring the convergence of Coding, Data, Graphics, Gaming, Animations, and AI
3. Emotional Intelligence Seminar: Navigating Team Dynamics in Technology Projects.
4. Project management Seminar: Introduction to Agile Project Management
5. Financial Intelligence Seminar: Introduction to an Integrated Financial Growth Plan.
6. Workshop: Groupings and Group Integration of Fellows
7. Introduction to SYL Multimedia Projects (EdTech, HealthTech, GovTech, InsurTech, AgricTech)
8. Introduction to Freelance Websites (Upwork, Turing): Optimizing Online opportunities for Building Enviable Portfolios
9. Excursion to a local player in the Technology Industry (African Centre for Excellence)
10. Project Presentation Review Sessions
11. Final Projects Presentation Seminars and Awards

Group Projects Options

1. Chatbot development for managing online CRM for Government agencies and organization
2. Public Healthcare systems: AI driven Avatars on displays that can assist doctors when scarce at primary healthcare centers
3. Intelligent Tutoring Systems for Public Schools in form of AI driven Display boards
4. Smart Farming solutions (Apps, Websites) for Poultry and Livestock Management
5. Effective Document Management Systems for Government Agencies
6. Chatbot based FinTech App based on indigenous Languages
7. Gamified App for teaching English and Mathematics to Primary School Students
8. An food recipe App based on picture of served food
9. A car assistance AI Agent in form of an App for helping with car emergencies.
10. An Interactive mobile App with animated illustration of advanced technologies (AI, Blockchain, IoTs, VR) in indigenous Languages
11. An App for automating the prompt reporting of Local, state and federal roads for necessary immediate action

Mode of Delivery and Program Structure

We shall be adopting a blended learning model that combine both in-person and online components to enhance the Fellow's experience with our company. Our approach ensures flexibility, engagement, and the development of peer-to-peer communities.

Program Structure

- Introductory Classes: We begin each program with a mandatory introductory class, setting objectives, tracking progress, and establishing ground rules. These sessions are conducted through a combination of Zoom meetings for remote participants and on-site sessions for those who prefer in-person interaction. This helps to foster a sense of community from the outset.
- Online Resources: We leverage technology to facilitate learning through Computer-Based Training (CBTs), our dedicated mobile application (Schoolmate), and an online portal. These platforms provide students with on-demand access to course materials, resources, and collaboration tools.
- Project-Based Learning: To ensure students gain competence in their areas of expertise, we incorporate project-based learning into our programs. This approach encourages practical application of knowledge and problem-solving skills, fostering a deeper understanding of the subject matter.
- Live-Online Sessions: We prioritize live-online participation for software-driven hands-on sessions. This allows for real-time interaction with instructors, fostering engagement and ensuring that students can ask questions and receive immediate feedback.
- Camp-Style Sessions: To maximize concentration and minimize distractions from daily work cycles, we employ a camp-style format for many of our training sessions. This involves immersive, intensive learning experiences that are designed to create a focused and dedicated environment conducive to deep learning.

- Peer-to-Peer Communities: We strongly believe in the value of building peer-to-peer communities within our training programs. To achieve this, we use the following strategies

  a. Group Assignments: We organize students into small groups to collaborate on various assignments and projects. This encourages peer-to-peer interactions, promotes teamwork, and allows students to learn from each other's experiences and perspectives.

  b. Real-Life Problem Solving: Many of our training programs are structured around solving real-life problems relevant to our society. By working together to address these challenges, students naturally form bonds and share experiences. These practical projects not only enhance their skills but also create a sense of community among participants.

  c. Online Forums and Discussion Boards: Our online portal includes discussion forums where students can engage in ongoing conversations, share knowledge, and seek assistance from their peers. These virtual spaces enable the building of a supportive community that extends beyond the classroom.

  d. Peer Review and Feedback: We incorporate peer review processes into assignments and projects. This not only helps students gain valuable feedback on their work but also fosters a sense of collective responsibility for each other's success.