



20 TRAINING APPROACH AND METHODOLOGY

The Pakistan MoIT is looking to partner with experienced technology education operators to create training programs to train the future of technical talent in Pakistan and enhance technical skills to match international standards and demands. The future graduates of these programs in Cloud Native Development, Data Science/AI/ML, Cybersecurity, and Blockchain will go on to compete for highly paid jobs offered by international firms who will therefore be more likely to expand their operations in Pakistan and bring new business to the country.

InfoTech and Vasona Systems International (VSi) has subcontracted Emeritus Institute of Management on this critical upskilling initiative. At Emeritus, it is believed that education has the power to fundamentally change the future of humanity. Talent and ability exists everywhere; but equal access to opportunity does not. Emeritus is on a mission to change that by making the highest-quality education accessible and affordable to individuals, companies, and governments around the world – especially education that translates directly into marketable skill sets that lead to employment.

Over the past decade, Emeritus have realized this goal by collaborating with more than 50 top-tier universities across the United States, Europe, Latin America, Southeast Asia, India and China. Short courses, degree programs, bootcamps, and senior executive programs help individuals learn new skills and transform their lives, companies and organizations.

Emeritus also recognize that traditional education, as well as modern self-paced education options, are not a great fit for many of today's learners. That's why Emeritus piloted the development of the Small Private Online Cohort, a learning model that is optimized for how adults learn. Students are given the flexibility to spend time with high-quality content, learning at the pace that works best for them – while also having an environment of peer support, interactivity, hands-on project work, career counseling, and live mentoring and coaching with expert course leaders.

The results of this model are evident in course completion rates of over 90% for Emeritus' professional learners. This unique model of state-of-the-art technology, curriculum innovation, and hands-on instruction from senior faculty, mentors and coaches has educated more than 250,000 individuals across 80 countries.

Emeritus' course leaders and curriculum designers have deep technical expertise in Data Science, Software Engineering, Cybersecurity, and Blockchain, and have built out our extensive and proprietary curriculum that teaches cutting-edge technologies and industry best practices.



20.1 TRAINING APPROACH

Emeritus' educational programs are tailored to meet the needs and business objectives of our clients. We provide educational training and human capital solutions that deliver real-world business value. The programs below have been prepared based on the needs outlined in the MoIT RfP.

Please note that all of the outlined trainings below may be customized further to meet the MoIT's educational goals.

In the following pages you will see:

- Suggested course outlines for Cloud Native Developer Customs program
- Emeritus Pedagogy, Instruction Format, and Curriculum
- Program timeline
- How will we setup the training program for success, including assessments, pre-course work and tracking success
- Delivery Methodology

20.1.1 **CLOUD NATIVE DEVELOPER CUSTOM PROGRAM**

About this course: Specific learning objectives and technology stack will be established when Emeritus conducts a requirements inception with MoIT. Training will be customized to fit the needs of the likely incoming student population.

In the first half of the class, students are in an immersive learning environment where they build a full stack application using agile/xp practices (including TDD, Extreme Programming, incremental design, etc.). During the second half of the class, students are back in the work environment pairing with Emeritus instructors to complete actual company projects. This ensures that the techniques learned in the in-class portion stick with the students as skills they can use in future jobs.

In the classroom, we balance enough theory/information with a lot of meaningful, hands-on application. This means that content is delivered in small chunks, then worked with in real time through paired activities, solo activities, group debates, solving small problems on miniature whiteboards, and hands-on-keyboard problem sets.

While students work through problems our instructors make themselves highly available by circulating the classroom. Instructors help students debug programming problems and unblock students while getting a sense of topics the class, as a whole, may be missing for quick-hit review as a group.



20.1.1.1 PRE-REQUISITES

Students should be able to demonstrate some level of programming proficiency in the chosen languages (Java, JavaScript).

20.1.1.2 WEEKLY COURSE WORK SCHEDULE

Weeks 1-6

In course weeks one through six students are in a full-time, immersive classroom environment. Lessons include a mix of direct instruction and lab time. During the first six weeks, Emeritus teaches an outside-in test-driven process for delivering a feature that is utilized throughout the remainder of the course. Students use and refine their understanding of this process in Weeks seven through twelve through direct product development.

Week 1 (Kickoff Week)

Intro to XP, XP Inceptions, JavaScript Fundamentals, TDD in JavaScript, XP Inception, Higher-order Functions, Asynchronous Callbacks, Closures

Week 2

Classes and Inheritance, Test-doubles, JS Framework (Angular/React), Advanced TDD, Story Writing, XP IPM, Pair Programming

Week 3

Advanced Git, 12 Factor Apps, Continuous Delivery (including initial introduction to cloud deployment technology), Layout for Developers, Microservice Fundamentals

Week 4

Packages, access modifiers, and scope, Reflection, Dependency Injection, Mocking, Asynchronous Programming in Javascript

Week 5

Promises, Microservice Development and Testing, Working with Databases/ORMs, Database migrations, JS Framework Patterns

Week 6

Async and await, Isolating impure functions in JS frameworks, User acceptance testing, XP Principles, XP Incremental Design

Weeks 7 -12

In the final six weeks of the program, the cohort will be broken into teams of 5 - 7 developers (or will break into pre-existing teams) to work on an application or product, using the techniques, practices, and technologies that they learned in the first 6 weeks of the program.

The teams will be able to develop a new product, or work on an existing application/project, to reinforce familiarity with how their new skill sets can be applied in the context of their normal roles. The teams will write their own user stories, get an understanding of how functional XP teams interact with project managers and product owners, and use test-driven development and XP values, principles, and best practices.



During this period, Emeritus instructors will work alongside each group to provide continued mentoring, pair program, help troubleshoot issues that arise, and encourage XP best practices.

Potential Add-ons:

Depending on the level of proficiency of the incoming students, additional weeks may be added that cover JavaScript Fundamentals, and/or Java Fundamentals.

If the MoIT would like to add Cloud Administrator training as an additional track, this will add approximately 8 additional weeks of training time to the outline above.