

Tech Saksham Program Brief

To summarize the program is delivered as follows:

Sl. No.	Content Type	Duration (Hours)
1.	Core content - Core Tech content (80 hours) - Employability skills (20 hours)	100
2.	Modular Content Delivery	20
3.	Project Work	40
	Total Program Duration	160
4.	Optional content for review through LMS	40
5.	Option content on openSAP and Microsoft portals	As required
	Total duration including optional content	160-200+

OVERVIEW OF PROGRAM VERTICALS

TSP will be offered in three distinct streams that are outlined below. Participants to choose an appropriate stream based on their existing skills and interest.

Program Vertical	Full Stack Web Development	Cloud Computing	Artificial Intelligence
Core topics covered for students (in detail) and briefly for teachers	<ul style="list-style-type: none"> ▪ Work with most popular web development technologies ▪ Create and host websites and web apps for commercial usage ▪ Create responsive and interactive UI ▪ Work with React JS framework to create responsive web applications ▪ Work with JAVA Spring framework for end-to-end web solutions ▪ Work with databases in web apps 	<ul style="list-style-type: none"> ▪ Understand what Cloud Computing is, benefits and its applications ▪ Work with cloud infrastructure and core services ▪ Create and manage virtual instances on cloud ▪ Choose and host applications on appropriate cloud services ▪ Create and host containerized applications on Azure cloud ▪ Create AI features for you application using cloud APIs 	<ul style="list-style-type: none"> ▪ What is AI and its applications ▪ Different tools and python packages used for developing AI applications ▪ Performing detailed data analysis ▪ How to process structured and unstructured data ▪ Creating, training, testing and deploying ML algorithms ▪ Using cloud-based tools for AI implementations
Pre-Requisites	<ul style="list-style-type: none"> ▪ Basics of working with Windows and Linux OS ▪ Knowledge of 	<ul style="list-style-type: none"> ▪ Basics of working with Windows and Linux OS ▪ Basic HTML.CSS and 	<ul style="list-style-type: none"> ▪ Basics of working with Windows/Linux OS ▪ Programming and

	Internet, Domains, Networking <ul style="list-style-type: none"> ▪ Core JAVA (J2SE) Programming and Coding Skills ▪ Fundamentals of Databases 	JS <ul style="list-style-type: none"> ▪ Programming and Coding Skills ▪ Fundamentals of Databases ▪ Fundamentals of Networking 	Coding Skills <ul style="list-style-type: none"> ▪ Fundamentals of Python ▪ Fundamentals of Databases
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PROGRAM CONTENT FOR STUDENTS

Vertical 1: Artificial Intelligence

Broad Agenda (Students): Artificial Intelligence

Sl. No.	Description	Duration Hours
1.	The 4 th industrial revolution and the key technologies in demand <ul style="list-style-type: none"> • Introduction to AI and understanding different AI terminologies • Understanding the evolution of AI and the AI winter cycle • The AI applications transforming various industries • Current AI market trends and opportunities • Chatbot fundamentals • Responsive & Conversational AI 	7
2.	Fundamentals of open-source Tools & Technology <ul style="list-style-type: none"> • Introduction to Data Analytics, its types and working with Anaconda tools • Working with Python programming language and its core libraries • Understanding advanced data types and data structures in Python 	8
3.	Data analysis with python to fuel AI applications <ul style="list-style-type: none"> • Data Science vs Data Analysis vs Data Analytics • Working with python for data science • Python packages for data analytics applications <ul style="list-style-type: none"> ○ NumPy ○ Matplotlib ○ Pandas • Understating web scraping for data gathering • Connecting SQL databases and performing crud operations using Python 	15
4.	Exploring and implementation of popular Machine Learning Algorithms with Python & open-source libraries like Scikit-learn <ul style="list-style-type: none"> • Introduction to machine learning and classification of Machine learning techniques • Understanding Supervised, Unsupervised, semi-supervised and reinforced machine learning algorithms • Implementing Machine Learning algorithms with Python packages and libraries • Azure ML Studio for designing & training models • Machine learning use cases 	25

	Developing Deep Learning Implementations with open-source deep learning frameworks like TensorFlow & Keras <ul style="list-style-type: none"> • Introduction to Artificial Neural Networks (ANN), Deep Neural Networks (DNN) and Deep Learning (DL) • Understanding how DL helps solve classical Machine Learning limitations • Implementation of deep learning networks like CNN with TensorFlow • Deep Learning use cases 	25
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Suggested Topics for Modular Engagement Activities/Bootcamps:

[Hands-on session for 2-3 hours to provide either revision of foundation skills or provide add-on advance skills related to track]

- Open-Source Operating System- Linux, Shell Commands & Shell Scripting
- Developing computer vision application with OpenCV
- Developing NLP application with Python NLTK
- Development and deployment of text based chatbot
- Deploying Machine Learning model to web/cloud hosting environment using Streamlit

Vertical 2: Cloud Computing

Broad Agenda (Students): Cloud Computing

Duration: 80 Hours

Sl.No.	Description	Hours
1	Moving Ahead with Cloud <ul style="list-style-type: none"> • What is Cloud Computing? Why Cloud Computing? Cloud Key Terminologies • Characteristics of Cloud Computing • Advantages of using cloud computing over on-premises infrastructure • Cloud Deployment Model • Cloud Service Delivery Model • Cloud Global Infrastructures 	10
2	Insights into Azure Cloud Environment <ul style="list-style-type: none"> • Cloud Core Services • Compute Services- Virtual Machine • Storage Services • Networking Services- VNET, Subnetting • Security & Monitoring Services 	20
3	Azure Database Services <ul style="list-style-type: none"> • SQL Databases and its operations • Azure MYSQL Server • Mem-cache in database instances • NoSQL Database in Azure - CosmosDB 	15
4	Azure Cognitive Services and Analytics Services <ul style="list-style-type: none"> • Language & Speech APIs • Custom Vision API 	15

	<ul style="list-style-type: none"> • Azure Analytics and Integration with Power BI tool 	
5	Building web applications with Azure <ul style="list-style-type: none"> • Azure App Services • Serverless Compute- Functions • Containerized App development using container services • DevOps services in Azure • Azure Monitor 	25

Suggested Topics for Modular Engagement Activities/Bootcamps:

[Hands-on session for 2-3 hours to provide either revision of foundation skills or provide add-on advance skills related to track]

- Open-Source Operating System- Linux, Shell Commands & Shell Scripting
- Performing Data Analytics using Azure
- Building Quick AI Features with Azure Cognitive Services
- Building Containerized Application using Azure Kubernetes Service
- Understanding DevOps tools & services with Azure Cloud

Vertical 3: Full Stack Web Development

Broad Agenda (Students): Full Stack Web Development

Duration: 80 Hours

S.No.	Description	Hours
1	Building Front Face for Web <ul style="list-style-type: none"> • Understanding the WEB <ul style="list-style-type: none"> ○ Internet, Web page, Website, Web applications • HTML for web Layout <ul style="list-style-type: none"> ○ HTML Basic Components, List, Tables, Graphics, Multi-Media, Forms, Text formatting, Block components • CSS for Page Design <ul style="list-style-type: none"> ○ CSS design principles, property:values, dynamic CSS3, box model, design layout controls • JS for Client-side scripting <ul style="list-style-type: none"> ○ Handling HTML Events, Animations, Reading element state & data, form handling and validations. Handling Cookies and Session Data • Building Dynamic web pages using HTML 5, CSS3 and JS <ul style="list-style-type: none"> ○ Understanding and using Bootstrap CSS & JS, using Bootstrap Components for quick design ○ Create a dynamic website/application using html-5, css3 and JS with Bootstrap components 	12
2	Handling the web data at backend <ul style="list-style-type: none"> • Revisiting Java Object Oriented Paradigms <ul style="list-style-type: none"> ○ Understanding OOP concepts through core Java ○ Core Java Annotations 	24

	<ul style="list-style-type: none"> • Understanding Server-Side Scripting <ul style="list-style-type: none"> ○ Why server side? How we do it? Server-side handling benefits • Introduction to Servlets and JSP <ul style="list-style-type: none"> ○ Syntax, semantics, servlet lifecycle, pre-defined objects and tags for JSP • Handling Client-side data <ul style="list-style-type: none"> ○ Reading HTML form data, handling data at backend, Projecting responses to front end • Managing Sessions at Server and Cookies at Client <ul style="list-style-type: none"> ○ Creating sessions, session data, reading and writing cookies at client side ○ Introduction to EL(expression language) and JSTL(java standard tag library) 	
3	Connecting End-to-End <ul style="list-style-type: none"> • Introduction to relational databases- MySQL <ul style="list-style-type: none"> ○ Introducing relational databases, need for database, persistent storage benefits, MySQL basics, commands ○ Handling databases using core JAVA ○ CRUD operations using SQL, DDL and DML ○ Creating DAO (database access objects) • Managing data in databases using JSP & Servlet <ul style="list-style-type: none"> ○ Connecting to MySQL DB, performing CRUD operations using, persistent storage of front-end data to MySQL DB ○ Handling NoSQL database- MongoDB 	18
4	Modern web development using ReactJS <ul style="list-style-type: none"> • Introduction to ReactJS <ul style="list-style-type: none"> ○ Basics of ReactJS framework, develop using React components and single page applications • Building React Native Application from Scratch <ul style="list-style-type: none"> ○ Creating UI using React Native ○ Creating Business Logic using J2EE ○ Creating Database Connectivity 	12
5	Web Development using Spring Framework <ul style="list-style-type: none"> • Understanding MVC <ul style="list-style-type: none"> ○ Maven Projects & Dependencies (pom.xml) ○ Working with annotations ○ Database CRUD operations using DB classes • Integrating web template UI with Spring <ul style="list-style-type: none"> ○ Creating responsive UI using Bootstrap ○ Integrating Spring with all CRUD operations 	14

Suggested Topics for Modular Engagement Activities/Bootcamps:

[Hands-on session for 2-3 hours to provide either revision of foundation skills or provide add-on advance skills related to track]

- Jump Start to J2SE
- Hosting Web Application/ Websites

- Digital Marketing for Business
- Quick Start to Spring Boot Framework