TPC
Performance
Centre

Software Engineering

Full Qualification

Tech Performance Centre: Software Engineering

TPC
Software engineering

Executive Snapshot

Launch your career as a job-ready **software engineer** with our **mentor-guided, portfolio-driven full qualification.** Over ~18 months of focused, studio-style learning, you'll progress from first principles to **production-ready full-stack development** across **Python & JavaScript, React, Django/DRF, SQL, Git, Docker, CI/CD**, and Agile teamwork.

No prior coding experience is required—our structured pathway builds disciplined habits, clean code practices, and real collaboration from day one. You'll learn by doing through hands-on labs, **48-hour code reviews,** and an industry-style capstone that mirrors workplace delivery. Graduates leave with a polished **professional portfolio**, live deployments, and the confidence to contribute on day one in roles such as **Software Developer, Full-Stack Developer, Backend Developer, Web Developer, or QA Automation Engineer** - meeting the talent needs of South Africa's fast-growing digital economy.

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Why Python Development?

Market Opportunity

In a tech-driven world where data and automation shape industries, Python developers - who can create scalable solutions and leverage frameworks like Flask and Django—are in high demand. From fintech firms in Johannesburg to global AI startups, companies seek skilled professionals to build data-driven applications, automate processes, and drive innovation.

Python's versatility makes you a vital asset across sectors like healthcare, finance, and tech. South Africa's tech industry, contributing 8% to GDP, has created over 50,000 new jobs since 2023, while junior Python developers earn R20,000/month, potentially reaching R75,000+ with experience. Globally, Python saw over 60,000 US job postings in 2024, with a 41% demand increase worldwide. Django remains a top framework, preferred by 74% of Python developers in 2024. Beyond financial gains, Python development offers intellectual fulfilment, enabling you to solve real-world problems in AI, data science, and web development.

TPC's program equips you to seize these opportunities, ensuring you thrive in a dynamic, high-growth market.

Python Fundamentals

Syntax, data structures (lists, dictionaries, sets), control flow, and debugging with tools like VS Code and pdb.

Intermediate Programming

OOP (classes, inheritance, polymorphism), exception handling, file I/O, and algorithms (searching, sorting).

Web Development with Python

Flask microservices, Django MVC, RESTful APIs with DRF, SQLAlchemy ORM, and authentication (JWT, Flask-Login).

Database & Cloud Deployment

SQL/NoSQL data modeling, database operations, Docker, and cloud deployment with Nginx, Gunicorn, and CI/CD pipelines.

DevOps & Collaboration

Git workflows, GitHub Actions, version control, code reviews, and Agile practices.

Professional Readiness

Problem-solving strategies, unit testing with pytest, technical documentation, and interview preparation..

Why This Program?

Program Overview:
What it entails

Become a production-ready software engineer through a structured, mentor-guided journey that mirrors real work. You'll move from first principles to full-stack delivery—building, testing, securing, deploying, and documenting software that solves real problems.

How it's organised

- **18 modules (~18 months):** each module = **1 month**, each component = **4 weeks**, each unit = **1 day** of focused learning.
- **Learn by building:** every month ends with a shipped artefact - CLI tools, APIs, dashboards, and ultimately a portfolio-grade capstone.
- **Studio workflow:** daily stand-ups, code reviews (48-hour turnaround), issue boards, PRs, and sprint retros - just like a modern dev team.

What you'll **master**

Core foundations:

Algorithms in plain English, control flow, data structures, modularisation, OOP, recursion, error handling, testing.

The stack:

Python & JavaScript, React (front-end), Django/DRF (back-end), SQL & data modelling, APIs, Docker, CI/CD.

Systems & modelling

UML, MVC, REST design, security basics, performance, observability, and documentation that professionals actually read.

Team skills

Git/GitHub workflows, code review etiquette, Agile ceremonies, psychological safety, and cross-functional collaboration.

Responsible engineering

POPIA/GDPR awareness, FOSS licensing, data ethics, and practical governance baked into projects.

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What You'll **Ship**

- **Working software:** deployed services, front-ends, and CLI tools with automated tests and pipelines.
- **Professional docs:** READMEs, changelogs, knowledge-base articles, and OpenAPI/Swagger specs.
- **Portfolio & presence:** live links, case studies, STAR stories, and a polished GitHub footprint that proves capability.

How You'll Be **Supported**

Mentor-guided learning

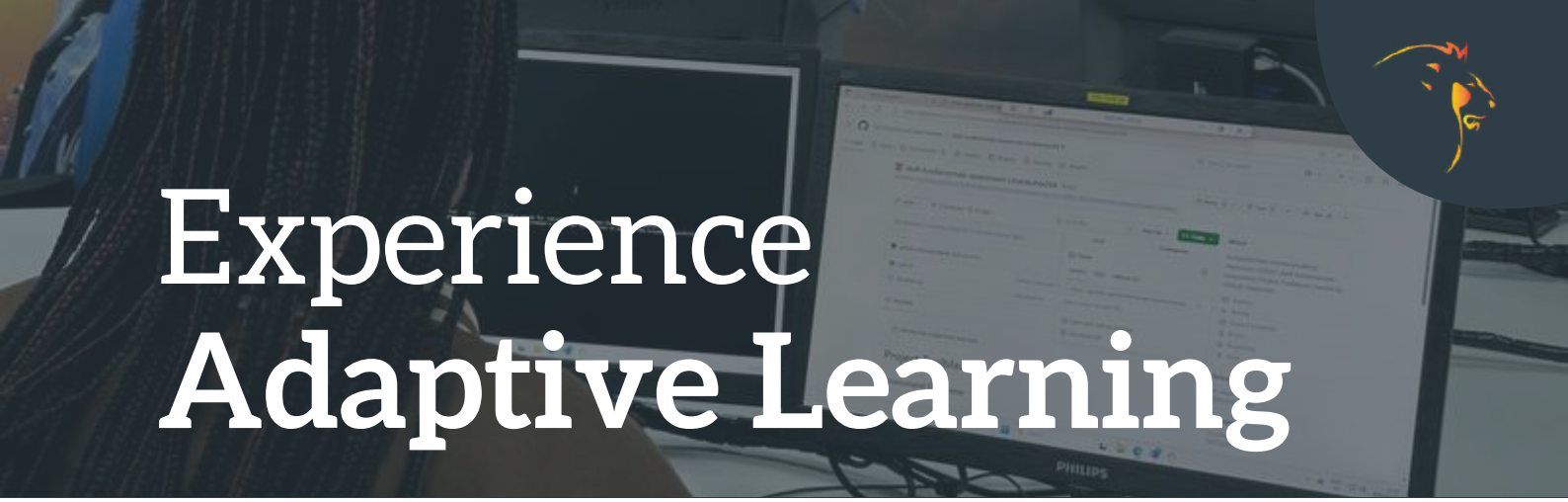
with structured feedback and targeted remediation.

Mock assessments

and interview prep, plus portfolio and LinkedIn optimisation.

Clear progression

from onboarding → full-stack sprints → capstone showcase, so you graduate confident and job-ready.



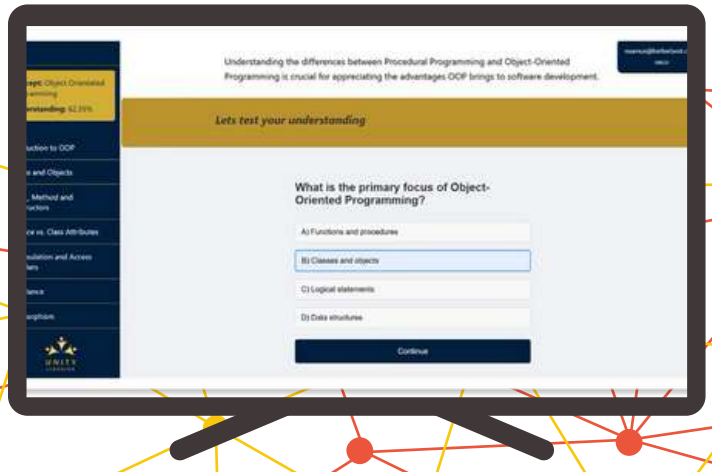
Experience Adaptive Learning

Your Personalised Pathway Powered by Unity Learning

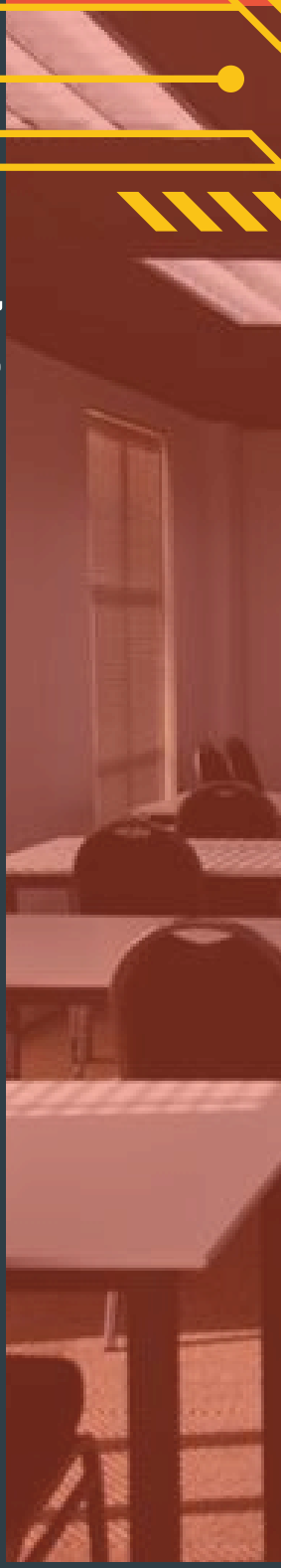
At TPC, we recognise that every learner is unique, with distinct strengths, learning styles, and goals. To ensure you thrive in our software engineering program, we've developed an intelligent, **AI-driven platform that delivers a truly personalised learning experience.** Unlike traditional one-size-fits-all bootcamps, our adaptive learning system dynamically tailors' content, exercises, and pacing to your individual needs, maximising engagement, retention, and **mastery of critical skills** like React, Firebase, and AI tools (GitHub Copilot, OpenAI Codex). This innovative approach empowers you to learn efficiently and confidently, setting you on a direct path to becoming a job-ready software engineer.

How Adaptive Learning Works

Our platform uses advanced algorithms to **analyse** your progress, learning preferences, and performance in real time. From the moment you begin, it assesses your responses to coding exercises, quizzes, and capstone projects, identifying areas of strength and opportunities for growth. Based on this data, the system adjusts the difficulty, format, and delivery of learning materials to suit your style - whether you excel with hands-on coding challenges, benefit from additional conceptual explanations, or prefer a faster-paced progression. For example, if you grasp JavaScript fundamentals quickly, the platform may introduce advanced topics like async/await earlier; if you need more practice with CSS, it will provide targeted exercises to build confidence. This dynamic **personalisation** ensures you're always challenged without feeling overwhelmed, creating a learning journey as unique as you are.



Benefits of Adaptive Learning



Personalised Pace and Content:

The platform adapts to your learning speed, delivering content that aligns with your current skill level, whether you're a beginner or have some coding experience, ensuring you stay engaged and progress efficiently.

Enhanced Retention:

By tailoring exercises to your learning style - visual, kinesthetic, or analytical - the system reinforces concepts in ways that resonate, improving long-term mastery of complex topics like OOP.

Seamless Integration with AI Tools:

The platform incorporates AI-driven development tools like GitHub Copilot and OpenAI Codex, guiding you to use them effectively in your personalised workflow, preparing you for the AI-augmented tech landscape.

Confidence Without Pressure:

Adaptive learning creates a supportive environment where you can focus on growth without the fear of falling behind, complementing our 1:1 mentorship and professional code reviews.

Our Learning Philisophy

At TPC, we believe that the fastest path to becoming a job-ready software engineer is through practical, industry-aligned training delivered by those who live and breathe code. Our programs are built on a philosophy that prioritises real-world skills, personalised mentorship, and a supportive community, ensuring you graduate not just with technical expertise but with the confidence and connections to thrive in the tech industry.

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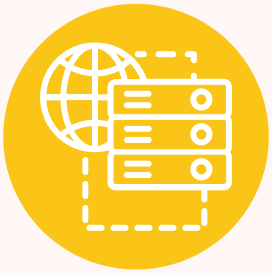
Here's what **Sets TPC Apart**

Learn from Industry Professionals, Not Professors

Our instructors are seasoned senior developers with years of experience building and deploying applications in fast-paced tech environments. Forget academic theory or "fluff" - every lesson is rooted in industry relevance, teaching you the hardcore skills needed to excel as a software engineer. Beyond core fundamentals, you'll master the "tricks of the trade"—practical techniques and problem-solving strategies that only come from real-world experience. This hands-on approach ensures you're equipped to deliver solutions that meet professional standards from day one.

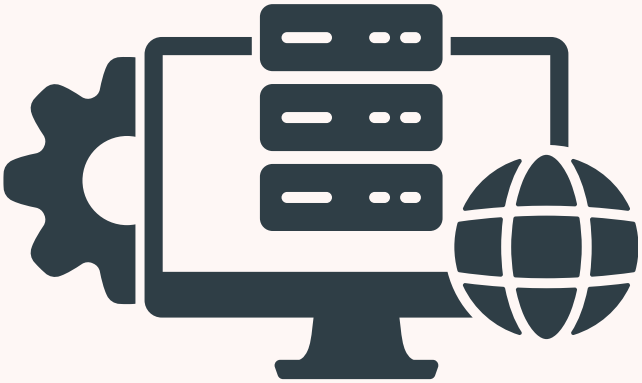
Personalised 1:1 Mentorship

Learning to code is a journey, and at TPC, you're never alone. You'll be paired with a dedicated mentor - a senior developer who provides tailored guidance through regular 1:1 session. This close relationship fosters a safe, judgment-free space to discuss challenges, explore roadblocks, and track your progress at a pace that suits you. Free from the fear of failure, you'll build confidence as you tackle complex concepts and refine your skills, knowing your mentor is invested in your success.



Code-Driven Instruction, Not Slides

Say goodbye to PowerPoint presentations and passive lectures. At TPC, you'll learn directly in the code editor, where concepts come to life through live coding, debugging, and hands-on exercises. Every lesson is interactive, ensuring you gain practical experience that translates seamlessly to the workplace.



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Here's what Sets TPC Apart

Professional Code Review

What truly distinguishes TPC is our rigorous code review process. Your work will be meticulously assessed by experienced developers who provide detailed, constructive feedback within 48 hours, mirroring industry practices. This intensive review not only sharpens your coding skills but also immerses you in professional standards—such as clean code, scalability, and security—from the outset. By internalising these best practices, you'll graduate with the skills and polish employers are looking for.

A Vibrant Community of Learners

At TPC, you're not just a student—you're part of a dynamic community of like-minded individuals united by a passion for technology. Through group workshops, peer coding challenges, and online forums, you'll forge lasting relationships that provide support and inspiration throughout the program and beyond. Our community extends to alumni and industry partners, offering networking opportunities that can open doors to your future career.

Straight Talk, Real Results

We believe in honesty and transparency. You won't find inflated job market stats or overhyped promises at TPC. Instead, we provide clear, realistic insights into the opportunities and challenges of a software engineer in an AI-augmented world. Our focus is on delivering measurable outcomes: a portfolio of deployed applications, mastery of in-demand tools, and the skills to compete in a global market. With TPC, you get the truth—and the training—to succeed.

Join us to experience a learning environment where industry expertise, personal support, and community spirit converge to transform you into a confident, capable developer ready to shape the future of tech.

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What You'll Learn

Professional Developer Fluency

Get comfortable on Windows, macOS, and Linux. Navigate the shell, manage processes and permissions, configure dotfiles, and work efficiently from the command line.

Technical Communication (Docs-as-Code)

Write clear READMEs, changelogs, and knowledge-base articles in Markdown. Use style guides, code blocks, tables, and review workflows so your documentation is as polished as your code.

Version Control & Team Workflows

Use Git like a pro: clean commits, branching models, pull requests, conflict resolution, and review etiquette. Plan work with issues, Kanban, and sprint rituals.

Algorithmic Thinking & Problem Solving

Translate real problems into step-by-step logic using pseudocode, flowcharts, and trace tables. Build the habit of reasoning before coding.

Programming Foundations (Python & JavaScript)

Master types, control flow, functions, and debugging. Learn to write readable code with clear interfaces, docstrings/JSDoc, and defensive checks.

Data Structures & Modularity

Work confidently with lists/arrays, dicts/objects, sets/maps. Design small, reusable modules and packages, manage dependencies, and follow semantic versioning.

Recursion, Functional Patterns & Error Handling

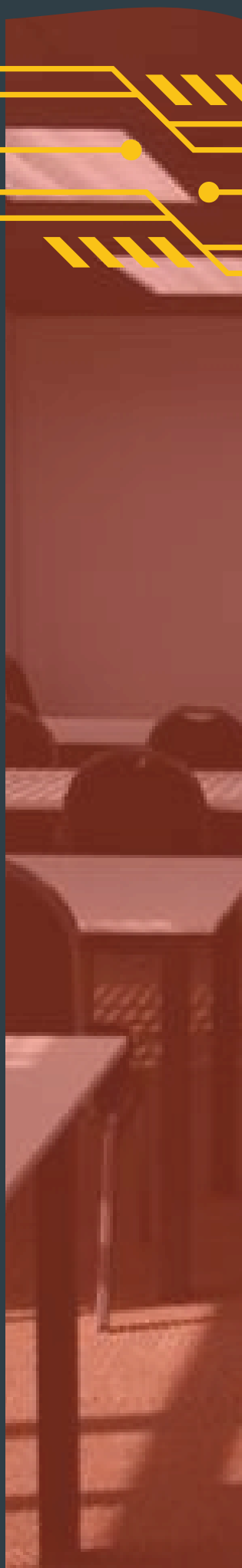
Apply recursion, higher-order functions, and robust exception handling. Reason about algorithmic complexity (Big-O) to choose efficient solutions.

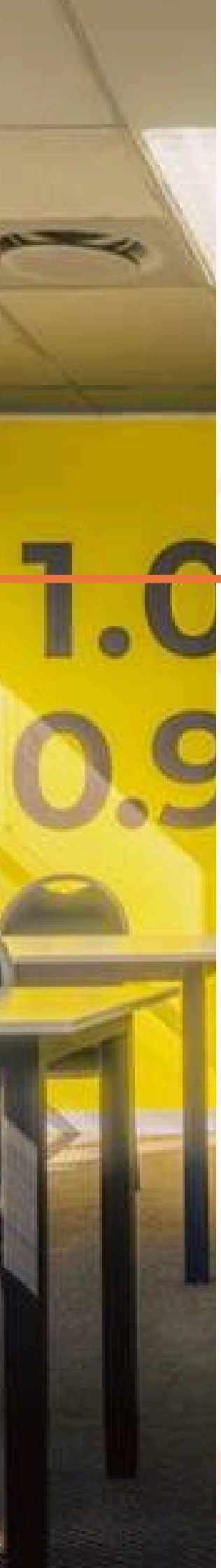
Relational Data & SQL

Model data with ERDs and normal forms. Query with SELECT/WHERE/JOIN, optimise with indexes and views, and connect applications to relational databases.

Design Thinking & Capstone Delivery

Interview stakeholders, define personas, prioritise features, prototype in Figma, and manage risk. Execute multi-sprint builds to a release candidate.





APIs, HTTP & Web-Scraping

Consume and design RESTful APIs, handle pagination and rate limits, and scrape HTML responsibly. Produce and read OpenAPI/Swagger specs.

System Modelling & Architecture

Capture systems with UML (use-case, class, sequence). Understand MVC, validation, middleware, and common backend patterns.

Frontend Engineering with React

Build accessible, performant UIs using components, state, effects, lists/keys, and routing. Ship polished features with testing and usability feedback loops.

Backend Engineering with Django & DRF

Design data models, views, templates, and forms. Expose secure APIs with serializers, viewsets, auth (tokens/JWT), and deploy backends confidently.

UX, Prototyping & Accessibility

Wireframe ideas, apply usability heuristics, run user tests, and measure outcomes. Improve accessibility and performance with deliberate design tweaks.

4IR Awareness (Gen-AI, IoT, Web3)

Understand modern trends, patterns, and pitfalls. Build small proofs-of-concept that connect future tech to practical software problems.

Full-Stack Integration

Connect React clients to Express/Django APIs, manage CORS, errors, and optimistic updates. Instrument end-to-end flows and handle real-world edge cases.

Testing Strategy & TDD

Use pytest and Jest/RTL for unit and integration tests. Practise red-green-refactor, aim for high coverage, and automate checks in CI.

DevOps, CI/CD & Containers

Build pipelines with GitHub Actions, containerise services with Docker, and add observability (structured logs, health checks, uptime and error tracking).

Security, Governance & Ethics

Apply basics of secure coding, dependency hygiene, POPIA/GDPR awareness, and FOSS licensing. Make ethical choices in data use and AI assistance.

Mobile Foundations (React Native)

Explore mobile UI components, navigation, and API sync to understand cross-platform constraints and opportunities.

Professional Readiness

Curate a portfolio with live links, case studies, and STAR stories. Optimise your CV/LinkedIn and practise interview techniques to land that first role.

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Program **Outline**

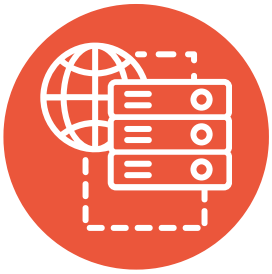
Breakdown of the Syllabus

Our Software Developer / Engineer programme is an immersive, mentor-guided journey that takes you from first principles to **production-ready full-stack delivery.** Across **18 modules (~18 months)** you'll build real software, practise team workflows, and graduate with a **portfolio, live deployments**, and a capstone that mirrors industry delivery. The syllabus is sequenced to compound skills—each month ends with a shipped artefact and feedback cycle.

Phase 1 — Foundations & Fluency (Modules 1–4)

- **Digital fluency & CLI habits:** cross-platform OS mastery, docs-as-code, Git collaboration, and a mini CLI capstone.
- **Algorithmic thinking:** pseudocode, flowcharts, debugging; functions and first tests.
- **Core programming depth:** data structures, modularisation, OOP, and collaborative workflows.
- **Advanced fundamentals:** recursion, error handling, complexity, and a TDD bootcamp.

Phase 2 — Data, Modelling & Services (Modules 5–6)

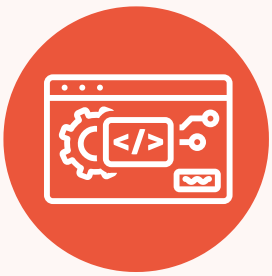


- **Relational data & SQL:** ERDs, joins, indexing, and a Pandas-powered KPI dashboard.
- **APIs & system modelling:** HTTP, respectful web-scraping, UML, MVC, and an integrated CRUD mini-service with Swagger.

Phase 3 — Frontend Engineering (Modules 7–8)

- **React essentials:** components, state, effects, lists/keys, accessibility and UX polish.
- **Advanced React & integration:** routing, custom hooks, API-driven widgets, and a full-stack dashboard with quality sprint.

Phase 4 — Backend Engineering (Modules 9–11)



- **Django foundations:** project/app structure, URLs, templates, forms & validation.
- **Advanced Django:** ORM performance, admin customisation, auth/authorisation, secure deployment.
- **Django REST Framework:** serializers, viewsets/routers, auth schemes, and React client integration.

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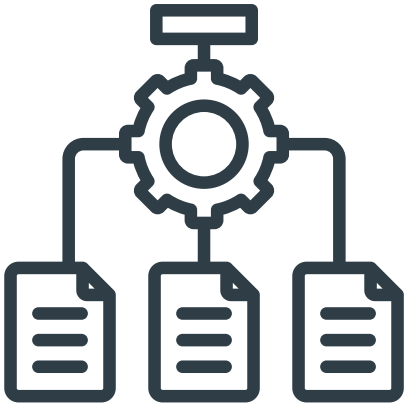


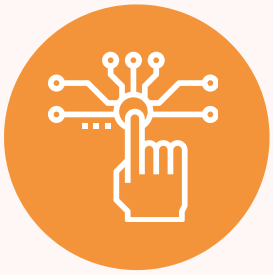
Phase 5 — Professional Practice (Modules 12–14)

- **Governance & agile delivery:** POPIA/GDPR awareness, FOSS licensing, Scrum ceremonies, and psychologically safe reviews.
- **Testing, DevOps & CI/CD:** pytest/Jest coverage, GitHub Actions, containers, observability and uptime.
- **Refactoring, UX & mobile:** SOLID, usability testing, and a React Native primer.

Phase 6 — Capstone Readiness & Build (Modules 15–17)

- **Design thinking & planning:** research, personas, prioritisation, Figma prototypes, risk spikes, charter.
- **4IR context & runway:** Gen-AI, IoT, Web3 primers; repo/branching and CI templates.
- **Capstone build:** four two-week sprints from MVP to release candidate with QA, security and performance gates.

Phase 7 — Launch, Portfolio & Readiness (Module 18)



- **Public launch & pitch:** production cut-over, press kit, portfolio & CV polish, mock interviews, mock-EISA (written + practical), and showcase with industry panel.

Join us to experience a learning environment where industry expertise, personal support, and community spirit converge to transform you into a confident, capable developer ready to shape the future of tech.

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Career Paths

React Developer

React developers build fast, accessible user interfaces and front-end features, using component architecture, hooks, routing, and modern tooling to deliver production-ready web apps.

Responsibilities include:

- Building reusable components and UI patterns with JSX and hooks (useState/useEffect).
- Managing client-side state, routing, and data fetching (e.g., React Router, custom hooks).
- Integrating REST APIs securely and handling errors, loading states, and optimistic updates.
- Optimising performance and accessibility (Lighthouse/a11y), and writing tests with Jest/RTL.

React remains one of the most in-demand front-end skills: in the 2024 Stack Overflow Developer Survey, 41.6% of professional developers reported using React (39.5% across all respondents). In the U.S., LinkedIn regularly lists tens of thousands of React roles (e.g., 49,000+ "React" jobs and 12,000+ "React JS Developer" searches), while the U.S. Bureau of Labor Statistics projects 8% growth for web developers and digital designers from 2023–2033.

In South Africa, React developer pay typically ranges from **~R20,000/month for juniors to R95,000+/month for senior talent, with OfferZen's 2024 benchmark showing R20,312 at entry level and averages of R71,793 (6–10 yrs) and R95,705 (10+ yrs)—top quartile exceeding R105,500.**

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Python Developer

Python developers build software applications, automate tasks, and analyse data, leveraging your bootcamp training in Python fundamentals and frameworks. Responsibilities include:

- Writing clean, efficient Python code for applications and automation scripts.
- Developing APIs and integrating systems using Flask or Django.
- Debugging and optimising code for performance and scalability.
- Collaborating with teams to deliver software solutions.
- Python's versatility ensures high demand, with over 60,000 US job postings in 2024. In South Africa, salaries range from R240,000 to R600,000 per year, with juniors starting at R20,000/month and seniors reaching R50,000+.

Back-End Developer

Back-end developers manage server-side logic and databases, using your skills in Django/DRF and SQLAlchemy to build robust systems. Key responsibilities include:

Designing RESTful APIs for seamless front-end integration.

Managing databases with SQLAlchemy, ensuring efficient CRUD operations.

Implementing authentication and security with JWT or Flask-Login.

Deploying applications using Docker and cloud services.

South Africa's tech sector, contributing 8% to GDP and adding over 50,000 jobs since 2023, relies on back-end expertise. Salaries average R300,000 to R650,000 per year, with strong remote work opportunities.

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Data Engineer

Data engineers manage data pipelines and analytics, using your Python skills in file I/O and database handling to support data-driven decisions. With Python's dominance in data science, this role is in demand, offering salaries from R300,000 to R840,000 per year in South Africa, with global opportunities in AI and cloud computing. Responsibilities include:

What are **the benefits?**

How this course sets you apart

Build what hiring managers can see

You graduate with live deployments, clean repos, and a polished portfolio—proof of real capability, not just certificates.

Train like you work

Daily stand-ups, issue boards, pull requests, code reviews (48-hour SLA), and sprint retrospectives mirror a modern engineering team, so you're productive from week one on the job.

Full-stack, end-to-end

From React front-ends to Django/DRF APIs, SQL data models, Docker, and CI/CD, you learn to design, build, test, secure, deploy, and observe production-grade software.

Evidence every month

Each module ends with a shipped artefact (CLI tool, API service, dashboard, UX prototype, etc.). You'll iterate with feedback and document your decisions like a professional.

Career momentum built in

Portfolio curation, CV/LinkedIn optimisation, STAR stories, mock interviews, and demo-day delivery help you translate skills into offers - confidently and credibly.

Professional engineering habits

TDD, coverage targets, accessibility and performance audits, OpenAPI docs, environment partitioning, logging, health checks, and uptime monitoring are baked into projects.

Clear structure, strong support

Modules (1 month) → components (4 weeks) → units (1 day) keep progress tangible. Mentors guide you with targeted feedback and remediation when you hit friction.

Responsible by design

POPIA/GDPR awareness, ethical data use, and FOSS licensing literacy ensure you can ship safely in real organisations.

Capstone that matters

A multi-sprint build, reviewed like a real product (QA, security, performance, UAT), culminating in a release candidate and a compelling case study for your portfolio.

Comprehensive Career Support

Our commitment to your success extends far beyond graduation. TPC's career services are designed to polish your professional profile, build your confidence, and connect you with top employers, ensuring you stand out in a competitive market. Here's how we help you launch your tech career:

Portfolio and Technical CV Development

Work with our career coaches to craft an industry-ready CV and a standout portfolio showcasing your capstone projects, such as a deployed React + Firebase application. We guide you in presenting your technical skills and AI-augmented workflows to align with employer expectations, highlighting your ability to deliver real-world solutions.

QCTO Certification

Graduates of the QCTO-accredited program receive a Occupational Certificate: Software Developer certificate, a recognised credential that validates your expertise in full-stack development and enhances your employability. Non-credit-bearing learners still gain a TPC completion certificate, affirming your proficiency in cutting-edge technologies.

Interview Preparation

Prepare for technical interviews with confidence through mock interviews and expert coaching from senior developers who've navigated the hiring process themselves. You'll learn to tackle coding challenges, articulate your problem-solving approach, and showcase your mastery of React, Firebase, and AI tools, giving you a competitive edge.

Access to Our Hiring Network

TPC partners with leading tech employers and startups across South Africa and beyond, connecting you to job and internship opportunities. Our career team works to facilitate placements within six months of graduation, leveraging our industry relationships to open doors to roles that match your skills and ambitions.

You'll leave with

Live projects

Links you can share in applications and interviews

Production-ready repos

Clean commit history, PR reviews, CI "green badge"

Technical docs

READMEs, changelogs, and OpenAPI/Swagger specs

Quality proof

Test coverage reports, Lighthouse/a11y results, monitoring screenshots

Career pack

Portfolio site, case studies, and interview-ready stories

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Admission & Next Steps

Joining TPC's Software Engineering Program is your first step toward a rewarding career as an AI-savvy, job-ready developer. Our streamlined admission process is designed to ensure accessibility, flexibility, and a personalised learning experience, whether you're pursuing the QCTO-accredited Occupational Certificate: Software Developer certification or the non-credit-bearing bootcamp. Below, we outline the clear, straightforward steps to secure your place in this transformative 18-month journey.

1. Apply Online

Begin by completing our user-friendly online application form at [https://techperformancecentre.com/programs/softwareengineer]. For the QCTO-accredited program, you'll need to submit supporting documents, including a certified copy of your ID and proof of your highest qualification (minimum requirement: Grade 12 or equivalent). No prior coding experience is necessary—our curriculum is crafted to guide beginners to advanced proficiency. Alternatively, you can opt for the non-credit-bearing bootcamp, which requires no supporting documents and offers the same hands-on training in React, Firebase, and AI tools like GitHub Copilot and OpenAI Codex, without the formal QCTO certification. This flexible pathway ensures everyone can access world-class training tailored to their goals.

2. Entry Quiz & Interview

After applying, you'll complete a brief entry quiz and participate in a short interview to assess your logical reasoning and learning readiness. No coding knowledge is required—these steps help us understand your problem-solving approach and ensure we place you on the optimal learning pathway. Our goal is to create a supportive environment where you're neither bored nor overwhelmed, setting you up for success as you master full-stack development and AI-augmented workflows.

3. Flexible Payment Options

Secure your seat with an initial payment covering the first month of the bootcamp, with the remaining balance payable monthly before each module begins. For those enrolling in the QCTO-accredited program, an ETQA processing fee applies to cover certification costs. Pay this fee upfront to enjoy a 50% discount, reflecting TPC's commitment to affordable, learner-friendly education. Prefer to pay in full? Our upfront payment option offers up to a 20% discount on total tuition, maximising value as you invest in your future. Contact our admissions team at [contact email/phone] to explore payment plans tailored to your needs.

4. Orientation & Program Start

Two weeks before the bootcamp begins, you'll receive a comprehensive orientation pack detailing the program schedule, access to our learning platform, and setup instructions for tools like VS Code, GitHub, and AI assistants (e.g., GitHub Copilot). This pack ensures you're fully prepared to dive into hands-on workshops, mentored labs, and code-review cycles from day one. Our dedicated support team is available to assist with any setup or onboarding questions, ensuring a seamless transition into your learning journey.

TPC - Tech Performance Centre

*"At TPC, we know - winning isn't for everyone. **But for our students, it's everything.**"*

Contact Us

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