

Become a AI Backend Engineer

12 months FT / 24 months PT | 4M SE Foundation + 8M
Specialization + 5M Mentoring | AZAV-certified

4.8  student ratings



Join
thousands
of satisfied
graduates...

10K+

Graduates have launched
their tech careers with MSIT.



600+

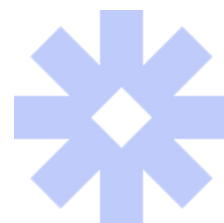
Companies have hired
our graduates.

85%

of our graduates in
Germany found a tech job.

96%

of our students would
recommend MSIT.



... with tech
jobs at **world-
leading**
companies.

 Microsoft  intel  NVIDIA Deloitte. Wix

 Meta  SAMSUNG  mobileye™ T E S L 𐀀

ebay  shopify  riskified waze  zalando

 Payoneer  home24  ONEDIGITAL  Taboola  Outbrain

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Why AI Systems Backend Engineering — and why now.

AI systems are no longer science fiction. Autonomous AI agents are already running in production — and their real power comes from the infrastructure behind them. You don't just use AI — you build the systems it runs on. This is the most technically advanced track at MSIT.

As the job market shifts, demand is accelerating fast — but talent is limited. That's where you come in.

- 67% expect AI agents in business processes within 18 months
- 3× faster deployment cycles with AI infrastructure
- 10,000+ MCP servers deployed — rapid growth
- 40% salary premium for AI-skilled backend engineers
- High demand, limited talent supply



As an AI Systems Backend Engineer, you'll:

- Build backend infrastructure for AI agents (APIs, tools, systems)
- Develop and deploy MCP servers for tool-integrated AI
- Design secure, scalable systems with validation and auth
- Deploy production-grade AI systems in the cloud

This program doesn't just teach backend engineering. It prepares you to build the infrastructure that powers real AI systems — in production environments.

What our graduates say



„Everything just fell into place with MSIT. It gave me the theory, the practice, the mentors and the kind of support I had never had in my life.“

Antonija Mohar, Deloitte

„Joining a MSIT training program was probably the best professional decision I ever made. I honestly don't believe I could have gotten to where I am today without their support.“

Tsahi Sharon, WIX



„The structure, the class, the curriculum, all the MSIT team is ready and well prepared to help you to succeed! One of the best decisions I took, 100% recommended.“

Alain Mani, Raketech

Who is this program for?

The AI Systems Backend Engineering program is designed for three target groups:

Career changers ready to enter the tech industry

You are starting without programming experience and want a future-proof tech career. The 4-month SE Foundation takes you from zero to solid backend level, step by step.

Professionals ready for a fresh start in the AI era

You want to reposition yourself professionally. Full-time or part-time, funded via Bildungsgutschein or QCG, you train for the growing AI infrastructure market.

Tech enthusiasts who want to build AI systems, not just use them

You want to understand how AI works under the hood and build the infrastructure behind it yourself: REST APIs, MCP servers, cloud. The deepest backend track at MSIT.



- No prior coding experience required
- Laptop provided
- €0 with Bildungsgutschein or QCG

Our goal is your **job offer**

At MSIT, we don't just train you — we help you land a job:



1:1 Mentoring

Personalized support throughout your learning journey, with a mentor always there to guide you.



Government-funded

With a Bildungsgutschein or QCG, your training is 100% funded. MSIT's AZAV certification ensures a smooth process and our team supports you every step of the way.



World-class curriculum

Our curriculum is built by industry experts and constantly updated to match the latest tools and job market demands.



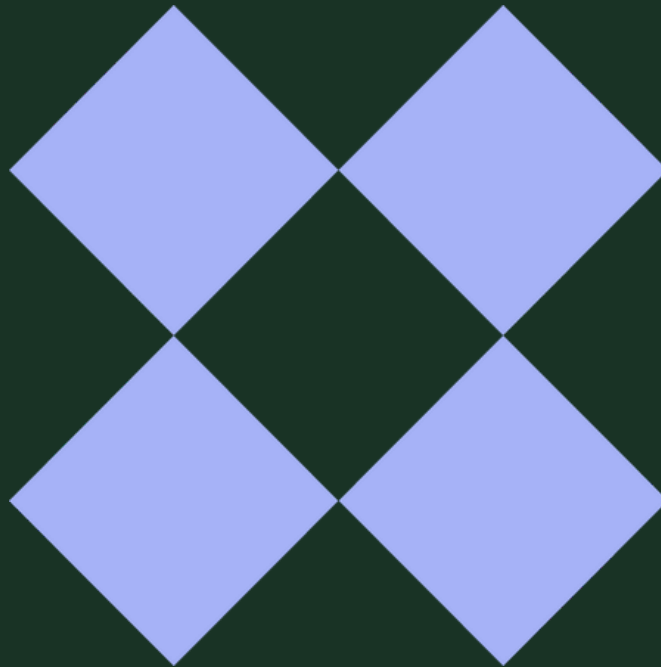
Unlimited career support

From CV to interviews, we support you every step of the way, even after graduation, until you land your job.



Free laptop

Get everything you need to succeed, including a laptop you can keep.



How you learn at **MSIT**

More about the student experience
and program schedule.

Program Structure

We've designed our training programs to evolve with both individual student needs and industry trends. **Here's how:**

The learning experience at Masterschool is personalized to fit each student's skills, pace and career goals to create an optimal learning experience for each student. We understand that career decisions evolve as you learn and our teaching methods reflect this thinking.

The curriculum is dynamic and adaptive. We are constantly tweaking the tools and technologies we teach, swiftly responding to the fast-changing industry. By constantly updating our content, we guarantee that our students are always learning the most relevant skills.

AZAV-certified program — all MSIT programs are officially recognized and fully government-funded. The technically deepest track at MSIT — 12 months of AI backend engineering plus 5 months of mentoring.

Note: This is the most comprehensive track with a 4-month SE Foundation. With backend experience, you can choose AI for Developers (6 months). For deep backend skills — MCP, tool execution, and production AI — this is the track.

12-month program

Foundation

🕒 Months 1-4

Fundamental backend development: OOP, Python, database design, SQL, REST APIs — the core foundation everything builds on.

Specialization

🕒 Months 5-12

REST APIs, tool schemas, data validation, authentication, MCP servers, cloud deployment, testing, and CI/CD. You build production-ready AI backend systems.

Mentoring Phase

🕒 Months 8-13

Parallel mentoring during specialization and beyond, with individual support for capstone projects and job preparation.

How you learn at MSIT

Guided, hands-on learning

Learn by doing with live sessions and guided practice. Build real projects from day one, no lectures, just experience.

Strong community

Learn alongside others and stay motivated together. Connect, collaborate, and grow your professional network.

1:1 support

Get continuous guidance from mentors and career coaches. Stay on track and become job-ready with personalized support.

Weekly Schedule — Full-Time

Two daily blocks with live sessions and guided practice, supported by mentors, Monday–Friday.

Part-time option

Attend one daily block and complete the same program over 24 months at a slower pace.

Important: 100% synchronous attendance is mandatory.

A Typical Week of Learning

	M	T	W	Th	F
9:00	Study Hall	Live session	Study Hall	Live session	Study Hall
10:00	Live session		Study Hall	Tutoring session	Project Work
11:00		Study Hall	Live session	Study Hall	
12:00	Study Hall		Study Hall	Study Hall	Study Hall
13:00					
14:00	Study Hall	Study Hall	Study Hall	Live session	Career Support
15:00	Live session		Live session		
16:00		Live session	Study Hall	Study Hall	Study Hall
17:00	Study Hall	Study Hall			
18:00					

* Schedules vary depending on each student’s pace and program. This is an example of a typical week.



Get familiar with the most important **AI backend engineering** tools & technologies.

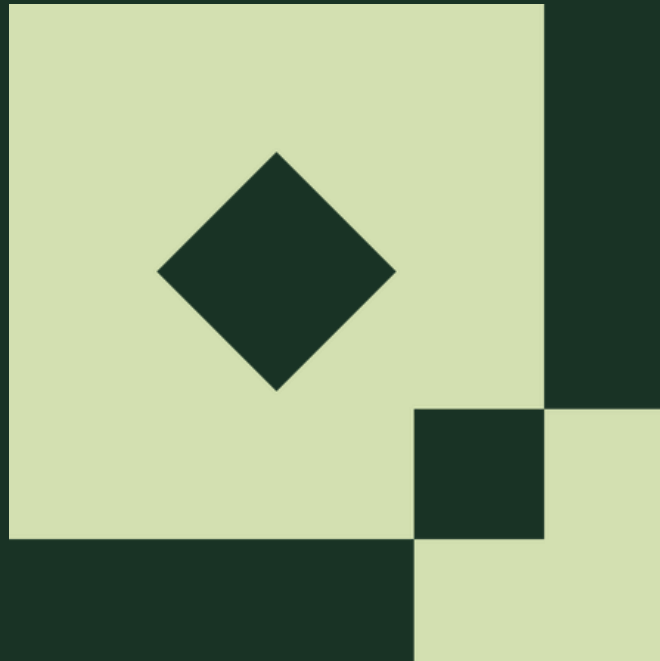
Learning materials are developed by industry experts. The curriculum is dynamic and continuously updated to reflect current trends and job market demands.

98%

satisfaction rate
2024 Success Report

You'll work with technologies including:

**Python • FastAPI
PostgreSQL • SQLAlchemy • SQL
JWT Authentication • Pydantic
OpenAI API • Gemini API
MCP (Model Context Protocol)
Docker • GitHub Actions
Pytest • Swagger/OpenAPI**



Foundation

Build core backend skills:
Python, APIs, databases,
and system design

Months 1–2

SE Fundamentals & Backend Craft

You start with solid fundamentals of backend engineering.

Content overview

- **Object-Oriented Programming:** Clean, maintainable code as the foundation for production-grade systems.
- **Python & Syntax:** Deep understanding of Python, the preferred language for AI backends.
- **Data Structures & Algorithms:** Understanding how data is organized and processed efficiently.
- **Version Control with Git:** Professional version control and collaboration workflows.

Technologies

◆ Python ◆ Git ◆ OOP Principles

Months 3-4

Databases & REST API Foundations

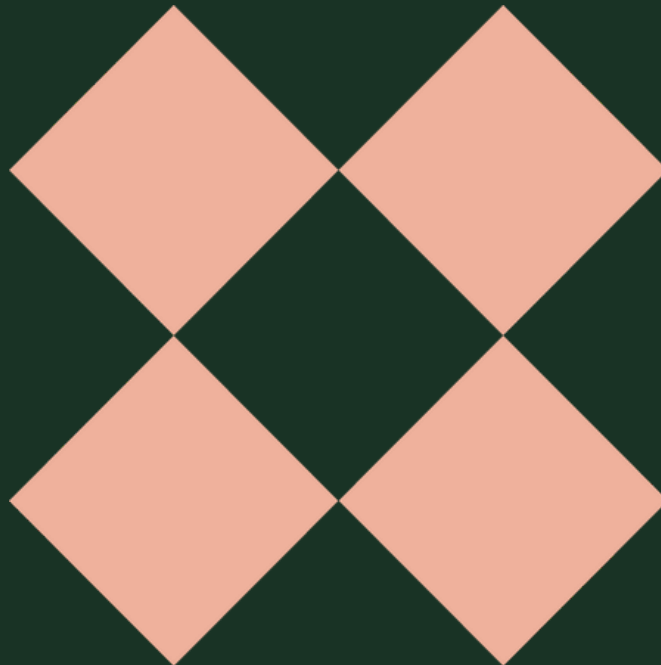
You learn how data is persistently stored and made accessible via APIs.

Content overview

- **Relational Database Design:** Entities, relationships, normalization — the backbone of every stable application.
- **SQL & ORM:** Raw SQL power plus SQLAlchemy for productivity and security.
- **REST API Design:** HTTP verbs, status codes, API versioning, error handling.
- **API Implementation with FastAPI:** Build modern Python APIs that are fast, secure, and self-documenting.

Technologies

- ◆ PostgreSQL
- ◆ SQLAlchemy
- ◆ Swagger/OpenAPI
- ◆ SQL
- ◆ FastAPI



Specialization

Develop production-grade
AI systems with MCP, cloud,
and scalable backend
architecture

Months 5–6

REST Endpoints & Authentication

You implement real, production-ready REST endpoints with security.

Content overview

- **REST Endpoint Implementation:** CRUD operations, pagination, filtering, error handling.
- **Authentication & Authorization:** JWT tokens, middleware, role-based access control.
- **Data Validation & Sanitization:** Pydantic models, input validation, security best practices.
- **Security Hardening:** CORS, rate limiting, SQL injection prevention, XSS mitigation.

Technologies

- ◆ FastAPI
- ◆ Pydantic
- ◆ JWT
- ◆ PostgreSQL

Tool Schema & MCP Fundamentals

Now it gets AI-specific: you learn how AI systems call external tools.

Content overview

- **Tool Schema Definition:** JSON schema for tool descriptions that AI systems understand.
- **Tool Validation & Safety:** Ensuring AI systems call tools correctly and safely.
- **Reliable & Deterministic Execution:** Error handling, timeouts, retry logic for tool calls.
- **Introduction to MCP:** Understanding the Model Context Protocol — the standard interface between AI and tools.

Technologies

- | | |
|----------------------|--------------------|
| ◆ JSON Schema | ◆ Function Calling |
| ◆ OpenAI/Gemini APIs | ◆ MCP Basics |

Months 9-10

MCP Server Implementation

You implement real MCP servers — the heart of this specialization.

Content overview

- **MCP Server Architecture:** Request/response cycles, lifecycle management, resource management.
- **MCP Transport Mechanisms:** Implement HTTP transport and STDIO transport — the two standard transports.
- **Exposing Resources, Tools & Instructions:** How to expose your backend functionality as MCP server capabilities.
- **MCP Client Testing & Validation:** Testing, debugging, and validating MCP servers.

Technologies

- ◆ MCP Protocol
- ◆ HTTP/STDIO Transport
- ◆ FastAPI
- ◆ Testing

Months 11-12

Cloud, Testing & Deployment

You make your systems production-ready and deploy them to the cloud.

Content overview

- **Unit & Integration Testing:** Pytest, test coverage, testing MCP servers and AI integrations.
- **Containerization with Docker:** Containerize your applications for consistent deployments.
- **CI/CD Pipelines with GitHub Actions:** Automated tests, builds, and deployments on every push.
- **Cloud Deployment:** Deploy your systems on AWS/GCP/Azure, scale, and monitor.
- **Capstone Project:** Build a complete AI backend system from scratch: REST API + database + MCP server + cloud deployment.

Technologies

- ◆ Pytest
- ◆ Github Actions
- ◆ Docker
- ◆ AWS / GCP / Azure

Project Portfolio: Your projects build on each other — Simple REST API → Authenticated API → Tool schema & calling → MCP server basics → HTTP-based MCP server → STDIO-based MCP server → Docker & CI/CD → complete capstone with MCP integration, cloud deployment, and AI client testing.

Learning Highlights



Learn the infrastructure, not the theory

You spend 12 months building backend systems for AI agents: REST APIs, MCP servers, tool schemas, validation, and cloud deployment. This isn't simulation — it's production-grade backend engineering.

MCP expertise — the protocol of the future

You learn MCP server development from scratch. You don't just understand tool integration — you implement MCP servers and gain a rare, high-value backend skill.

The most complete backend track — with foundation included

With the 4-month SE Foundation, you gain everything needed to reach a high level in AI backend engineering — whether starting fresh or with experience.

100% production-focused + 5 months mentoring

You build real systems with Pytest, Docker, CI/CD, and cloud deployment. No theory — only scalable, production-ready backend engineering with 5 months of mentoring.



PCAP - Certified
Associate Python
Programmer



PCEP - Certified Entry-
Level Python
Programmer



Career Support

1:1 guidance at every stage
of your job search.

Career support for a **fast job start**.

At MSIT Institute of Technology, your career launch is our shared mission. That's why we offer a comprehensive career support system that equips you with everything you need for a successful job search.

Our approach is hands-on and individualized — because we know every career path is different. From your first application to a signed employment contract, we're by your side.

Career Sprint: Job-ready — before everyone else

A two-week intensive course helps you build a strong online presence and start networking before graduation. You'll learn proven methods that set you apart from other applicants and maximize your visibility with recruiters.

- Optimize your CV and LinkedIn profile
- Learn how to stand out among other applicants
- New networking strategies open doors in your industry



Dedicated Career Success Advisors (CSAs)

CSAs are professional job search experts — and they'll guide you through yours. They know the German job market inside out and help you present your strengths convincingly.

- Personal 1:1 coaching to optimize applications, set goals, and stay motivated
- Individualized feedback on CVs, pitches, and interviews
- Expertise for platforms like LinkedIn and StepStone



Career Sessions (Group)

- Speed Applications: Send multiple applications together as a group.
- Networking Crash Course: Use events to connect with recruiters.
- Interview Practice: Master HR screenings and technical interviews.
- Mindset: Stay motivated and resilient.



Practice with Industry Experts

1:1 prep meetings with experienced professionals for HR screenings, technical interviews, evaluations, and industry-specific application strategies. You'll walk into every conversation fully prepared and impress with expertise and confidence.



Job Search Platform

The MSIT Campus platform becomes your career hub: curated job listings, advanced job search resources and materials, plus a toolkit for CVs and cover letters. You'll also gain access to exclusive partner companies that are actively looking for MSIT graduates.

Our career support doesn't end when you finish the program. Even after graduation, our CSAs and the Campus platform remain available to you, so you can find the perfect start to your new career.





FAQs

FAQs

Do I need backend experience?

No! The 4-month SE Foundation teaches you everything from the ground up: OOP, Python, databases, REST APIs. If you already know how to code (Python, SQL, APIs), AI for Developers (6 months) is the faster alternative for you.

What does the program cost?

You pay €0. The program is fully government-funded — through the Bildungsgutschein (education voucher) from the Agentur für Arbeit (for job seekers) or the Qualifizierungschancengesetz/QCG (for employed professionals).

How long is the program really?

12 months (full-time) or 24 months (part-time) are the official durations. The structure is: 4 months SE foundation + 8 months specialization + 5 months mentoring (in parallel). The mentoring phase supports you through your job start.

What's the difference from AI for Developers?

AI for Developers (6 months) is for people who already know how to code — direct LLM integration. AI Systems Backend Engineering (12 months) starts with SE Foundation and goes deeper into backend engineering, specialized in MCP server development and tool execution. This is technically more in-depth.

Can I study part-time?

Yes! Full-time (12 months, ~40h/week) or part-time (24 months, ~20h/week, one block per day). Content is identical — only the pace differs.

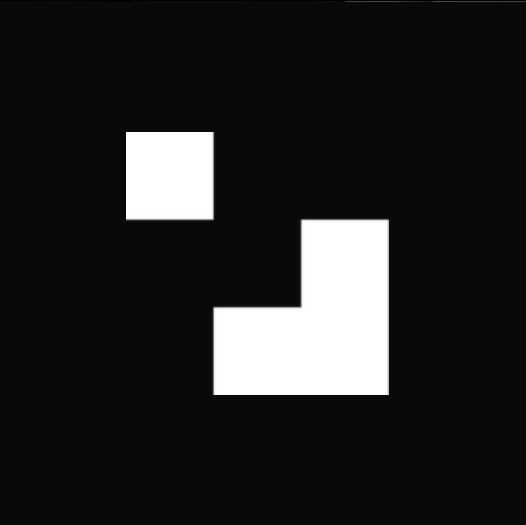
FAQs

What's my career path afterward?

With AI Systems Backend Engineering, you're immediately hireable as: AI backend engineer, MCP server specialist, AI infrastructure engineer, backend architect (AI-focused). Senior backend engineers with AI specialization earn €110K–€150K.

Do I get a laptop?

Yes. You receive a laptop that's yours to keep after the program.



„I had to start from zero, with no tech background whatsoever. It took a lot of courage — but MSIT was exactly what I needed.“

Patricia Sedó, Onlyfy