GTC Transforming Emerging Economies

GTC International Consulting Limited
Riverbank House
1 Putney Bridge Approach
Fulham, London, SW6 3BQ
T: +44(0)2037055710
E:enquiries@thegtcgroup.com
W: www.thegtcgroup.com

Advanced Algorithms & Logic Design

COURSE OVERVIEW

This course moves beyond foundational programming into the core of computational thinking. As an advanced course, it explores the sophisticated algorithms and formal logic that power modern computing systems, from enterprise software to AI and distributed networks. It covers advanced algorithmic techniques like dynamic programming and greedy methods, with a focus on real-world optimization problems relevant to engineering, finance, and technology. The logic design component emphasizes digital circuit design, FPGA implementation, and optimization for high-performance systems. Participants will learn not just to solve problems, but to analyze the inherent complexity of a problem and architect the most elegant, efficient, and scalable solution possible.

WHO SHOULD ATTEND?

This course is designed for experienced engineers, software developers, system architects, and technical specialists. It is also suitable for professionals in embedded systems, AI hardware design, telecommunications, finance, and technology innovation. It is ideal for anyone looking to deepen their skills in efficient algorithms, advanced data structures, and digital logic systems to solve complex problems, improve system performance, and apply modern algorithmic and logic design techniques to real-world projects.

COURSE OUTCOMES

Delegates will gain the skills and knowledge to:

- Analyze algorithmic complexity with clear asymptotic methods to assess time–space trade-offs.
- Design advanced data structures and algorithms across graph theory, dynamic programming, and greedy methods.
- Apply formal logic and automata theory to model systems and solve problems in AI and verification.
- Tackle NP-complete problems using effective approximation and randomized algorithms.
- Architect solutions for parallel and distributed systems with a solid grasp of concurrency and synchronization.
- Critically evaluate algorithmic strategies to build scalable, high-performance real-world systems.

KEY COURSE HIGHLIGHTS

At the end of the course, you will understand;

- How to analyze algorithm performance in different scenarios.
- Design efficient algorithms using divide-and-conquer, greedy, and dynamic programming.
- Use complex data structures like trees, heaps, and graphs effectively.
- Prove algorithm correctness and optimize their runtime.
- Design and optimize digital logic circuits using VHDL and FPGA.
- Implement asynchronous sequential circuits and perform digital system testing.
- Apply graph algorithms and linear programming for resource scheduling in high-level synthesis.

All our courses are dual-certificate courses. At the end of the training, the delegates will receive two certificates.
1. A GTC end-of-course certificate
2. Continuing Professional Development (CPD) Certificate of completion with earned credits awarded