

Parallel, Asynchronous and Multithreaded Applications

Course code: GOC407

The course is intended for experienced developers who would like to improve their knowledge and want to learn about parallel and asynchronous applications. There will learn the basics of threads and objects and familiarize themselves with the products which enable this kind of programming. A lot of these new features come with .NET Framework 4 (e.g. Task Parallel Library) and 4.5 (e.g. async/await). We will talk about the differences and find solutions for dealing with IO bound and CPU bound problems. We will also look at Power Threading Library. In the last few lessons of the course we will concentrate on the solutions dealing with the synchronization such as locky, mutexes, lock-free operations and we will also talk about their specific and the suitability to particular solutions.

Affiliate	Duration	Course price	ITB
Praha	3	16 500 Kč	30
Brno	3	16 500 Kč	30
Bratislava	3	660 €	30

The prices are without VAT.

Course terms

Date	Duration	Course price	Type	Course language	Location
25.05.2026	3	16 500 Kč	Presence	CZ/SK	GOPAS Praha
24.06.2026	3	660 €	Online	CZ/SK	Online
24.06.2026	3	16 500 Kč	Online	CZ/SK	Online
⚙️ 27.07.2026	3	16 500 Kč	Presence	CZ/SK	GOPAS Brno
30.09.2026	3	16 500 Kč	Presence	CZ/SK	GOPAS Praha
18.11.2026	3	16 500 Kč	Presence	CZ/SK	GOPAS Brno

The prices are without VAT.

What we teach you

To create applications which will use all power of HW and therefore they are quicker

Applications which are scaling well on new devices

To think about the basic problems and system sources in a new innovated way

Required skills

Experience with creation of the application in C# language

Course outline

Parallelism

- Current state, future of command
- Description of typical problems

Synchronization

- Lock/Monitor
- Spin-wait
- Interlocked - lock-free operations
- Mutex, EventWaitHandle, Semaphore, ReaderWriterLockSlim
- Assembling of locks and their types
- Lock free thinking

GOPAS Praha

Na Strži 2097/63
140 00 Praha 4 - Krč
Tel.: +420 226 201 390
info@gopas.cz

GOPAS Brno

Nové sady 996/25
602 00 Brno
Tel.: +420 530 513 590
info@gopas.cz

GOPAS Bratislava

Dr. Vladimíra Clementisa 10
Bratislava, 821 02
Tel.: +421 902 903 132
info@gopas.sk



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Parallel, Asynchronous and Multithreaded Applications

- A little bit of .NET memory model

IO bound operations

- Description
- Specifications
- Asynchronous (non-blocking) processing

CPU bound operations

- Description
- Specifications
- Support in .NET
- Class Thread, in other words all hard-boiled
- ThreadPool

NET 4

- PLINQ
- Task Parallel Library
- Improved ThreadPool
- Work stealing

NET 4.5

- Asynchronous (non-blocking) processing
- New key words async/await
- New "Async" methods in .NET
- Cooperation with Task/Task
- Progress reporting

Power Threading Library

- AsyncEnumerator
- Classes which can enable you to work in multithreaded environment and to scale (ReaderWriterGate, spin-locky...)

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