Programme Description CAS Applied Quantum Computing for Life Sciences and Business

1. Overview

Degree to be acquired	Certificate of Advanced Studies FHNW Applied Quantum Computing for Life Sciences and Business
Type of Programme	Part-time
Language	English
ECTS-points	10
Duration	15 days
Learning Outcomes / Competences	Graduates will be able to: - Describe the differences between quantum and classical computation. - Discern potential performance gains of quantum vs. classical algorithms. - Assess the business applications of quantum computation. - Understand engineering challenges currently faced by developers of quantum computers. - Become proficient with engineering requirements for quantum vs classical algorithm implementation. - Discern the scientific limits of quantum algorithms for chemistry and optimization. - Determine technical requirements for quantum computers to run realistically large quantum algorithms. - Evaluate key technology requirements for quantum computers to be able to function properly. - Understand the mathematical description of quantum states and basic quantum operations and algorithms. - Effectively communicate the technical aspects of quantum computing to non-experts in the field, such as medical professionals, solution providers or decision makers.
Programme Start	As mentioned on the website
Application Deadline	As mentioned on the website

Admission Criteria	Tertiary educational qualification (at least Bachelor degree level) and relevant professional experience or Federal Diploma of Higher Education (from a Swiss “Höhere Fachschule” or “eidg. HFP” or “eidg. BP”), and at least 3 years of relevant professional experience in a subject relevant to or related to the continuing training programme. Interested persons without tertiary educational qualification can be admitted, if they have a minimum of 5 years professional experience in a subject relevant to or related to the continuing education programme and if they have successful completed various continuing training courses (in-company or CAS/MAS/DAS) or discontinuation of tertiary education with advanced participation or partial achievement (> 50%) As the instruction and educational materials are in English, proficiency in English (minimum level C1) is a prerequisite.
Prerequisites for beginning the Final Thesis	80% presence and completed presentation.
Graduation Requirements	Final written exam, individual project incl. presentation: pass
Price (included services)	As mentioned on the website
Additional Fees	None
Terms of Payment	As per invoice or Conditions of Admission
Head of Programme	Clément Javerzac
Programme Administration	weiterbildung.lifesciences@fhnw.ch
Further Information / Links	https://www.fhnw.ch/en/continuing-education/lifesciences/cas-applied-quantum-computing-for-life-sciences-and-business

2. Module Plan

No.	Module description and content (key words)	Testing method for each module	Assessment[1]	ECTS (per module)	Work volume/ Study hours (including preparatory and follow-up work)	Mode (Presence, Online, Hybrid)
1	- Introduction - Basics of quantum information - Basics of quantum computing - From classical computational challenges to “quantum Hello World”	-	-	2.5	75 h	Presence (online days will be announced)
2	- Introduction to various quantum hardware and software alternatives. - Workshops with main commercial options	-	-	2.5	75h	Presence (online days will be announced)
3	- Review and hands-on practice of various quantum algorithms - Application of use cases	-	-	2.5	75h	Presence (online days will be announced)

[1] Scale of 2: satisfactory/unsatisfactory or scale of 6: 6=excellent, 5.5=very good, 5=good, 4.5=satisfactory, 4=sufficient, 3=inadequate, 2=poor, 1=very poor

4	- Beyond quantum computing - Quantum ecosystem - Trends	Final written exam and individual project	Scale of 2	2.5	75h	Presence (online days will be announced)
			TOTAL	**10**	**300h**	

Created on 23rd January 2024