Integration Systems

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The course in Integration Systems for PhD students is designed to train highly specialized researchers and professionals in software engineering, with a particular focus on integrating complex systems, developing distributed applications, and designing innovative software architectures. The program combines a solid theoretical foundation with a practical approach, preparing PhD candidates to tackle the most advanced challenges in the world of technology and research.

Course Objectives:

1. Integration Systems: Explore techniques and methodologies for integrating heterogeneous systems, with a particular focus on interoperability between different platforms and technologies. PhD candidates will acquire skills in using middleware, APIs, and communication protocols to ensure seamless and scalable integration.

2. Introduction to Front/Back End Programming: Provide a comprehensive overview of software development, focusing on client-side (Front-end) and server-side (Back-end) programming. Modern languages and frameworks will be covered, along with best practices for creating robust and high-performance web and other platform applications.

3. Concurrent and Distributed Systems using REST or Real-Time Architectures: Examine the principles behind concurrent and distributed systems, with an emphasis on implementing architectures based on REST (Representational State Transfer) and Real-Time protocols. PhD candidates will learn to design scalable, reliable, and high-performance systems.

4. Microservices Applications: Study microservices architecture, with a focus on the design, implementation, and management of modular and scalable applications. The advantages and challenges of this approach will be analysed, along with the most widely used tools and platforms in the industry.

5. Internet of Things Applications:

Delve into the development of IoT applications, focusing on the integration of smart devices, the management of generated data, and the implementation of scalable and secure solutions. Communication protocols, network architectures, and real-time data analysis techniques will be covered.

6. Integration and Communication: Explore advanced techniques for system integration and communication, with a focus on network protocols, communication security, and data management. PhD candidates will gain expertise in designing efficient and secure communication systems in complex environments.

7. Designing Tools for Research: Provide the tools and skills necessary to design and develop custom tools that support research activities. PhD candidates will learn to create ad-hoc software for data collection, analysis, and visualization, optimizing the research and experimentation process.