

Distributed Systems COMP28112

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About Distributed Systems

- ▶ Are complex systems, encompassing not one but a (potentially large) collection of computers, all connected via a network, over which they communicate by message passing.
- ▶ Their complexity is so well hidden that users have no awareness they are dealing with a distributed system.
- ▶ We use distributed systems on a daily basis. They are a big part of our lives and we have been growing increasingly dependent on them.
- ▶ They have changed our lives, allowing us to do things that we could only dream of before.
- ▶ Learning about these systems is not an easy journey, but certainly a fascinating one.
- ▶ Our focus for this course will be on the understanding of basic concepts, principles, techniques and methods associated with the architectures, functionality and applications of distributed systems. We hope that you will become so interested in them that will take more advanced courses in distributed systems in the future.



Learning Outcomes

- ▶ Understand the main principles, techniques and methods supporting the basic functionality of distributed systems.
- ▶ Be able to identify applications where distributed computing is used and its impact on society.
- ▶ Understand the main issues to be considered when designing a distributed system.
- ▶ Understand how the main principles, techniques and methods supporting distributed computing are applied in practice in existing systems
- ▶ Be able to design and implement prototypical distributed computing applications using available technologies.



Syllabus

► Part 1

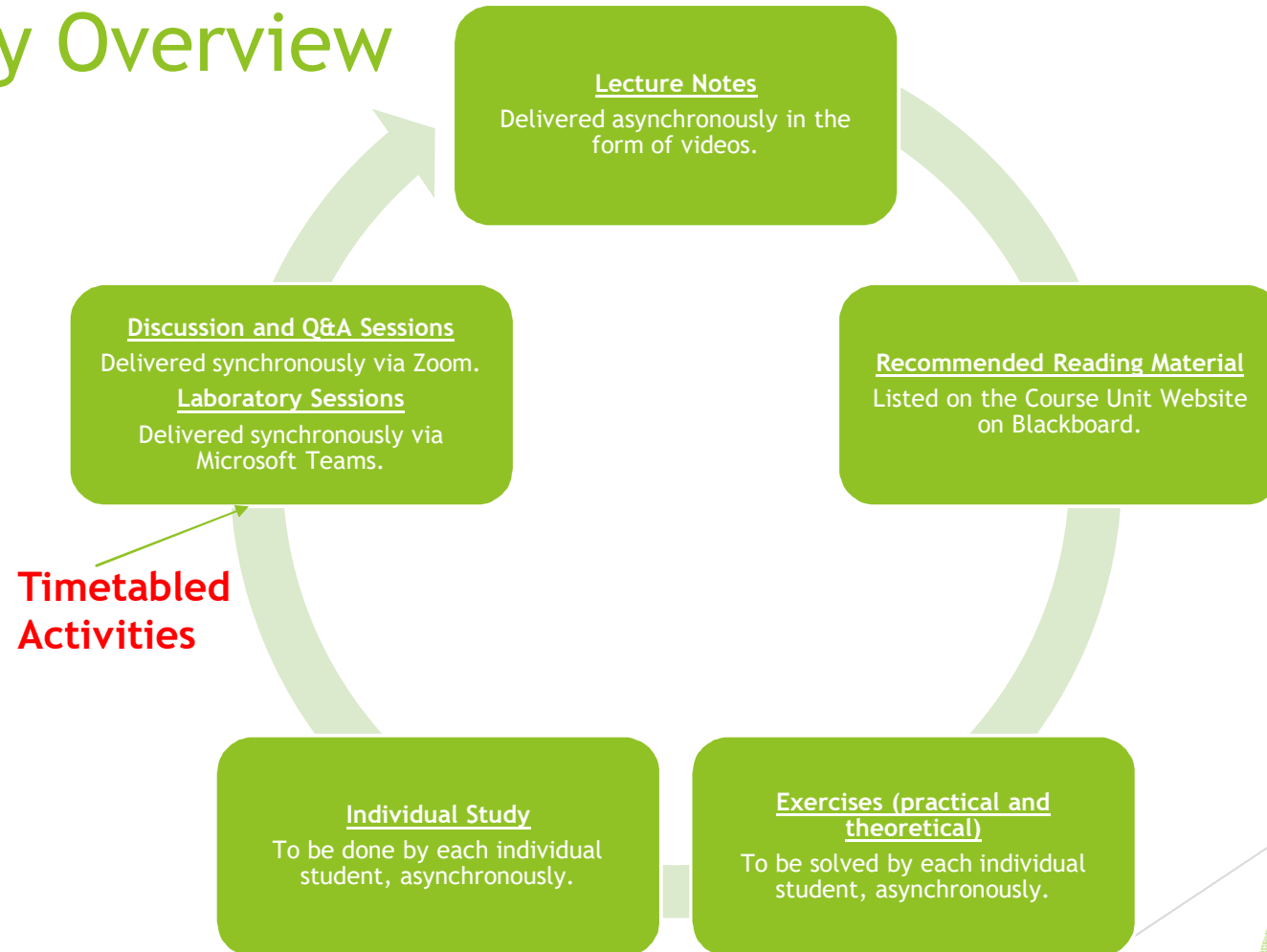
- Introduction to Distributed Systems
- Basic Concepts:
 - Naming Schemes
 - Protocols
 - Synchronization
- Sequential vs. Multi Processing
- Concurrent, Parallel and Distributed Computing
- Architectures
- Inter-Process Communication

► Part 2

- More on Service-Oriented Architectures
- Caching and Replication
- Fault Tolerance
- Security
- Cloud and Edge Computing
- More DS Applications



Delivery Overview



Assessment

- ▶ Coursework
 - ▶ 100% of marks.
 - ▶ Individual.
 - ▶ Combines practical work with application and analysis questions.
 - ▶ In the form of laboratory/practical exercises, analysis questions and a quizz.
 - ▶ Laboratory Exercise 1 - deadline: end of Week 5.
 - ▶ Laboratory Exercise 2 - deadline: end of Week 8.
 - ▶ Laboratory Exercise 3 - deadline: end of Week 12.
 - ▶ Quizz_Week_12 - deadline: end of Week 12.
 - ▶ Practical work involves programming (mainly) with Python.

