

## TDDD25 Distributed Systems / *Distribuerade System*

### Reading directions / *Läsanvisningar*

The materials discussed at the lectures will be *directly* covered by the written examination; this material you have to understand and, at the same time, know how to apply to solve problems.

In order to prepare for the exam, you have to study:

1. **Lecture notes:** *all the material* presented in the lecture notes may appear in the examination.
2. **Textbook:** you find below chapters and paragraphs from the book by Coulouris et al., “*Distributed Systems – Concepts and Design*” (**fifth edition**), which are related to the examination topics and serve for a better understanding of the material.

#### **Chapter 1. Characterization of Distributed Systems**

- 1.1 Introduction
- 1.2 Examples of Distributed Systems
- 1.5 Challenges

#### **Chapter 2. System Models**

- 2.1 Introduction
- 2.3 Architectural models
- 2.4 Fundamental Models (without security model)

#### **Chapter 3. Networking and Internetworking**

- 3.4.6 TCP and UDP

#### **Chapter 4. Interprocess Communication**

- 4.3.0 External data representation and marshalling,
- 4.3.1 CORBA common data representation and marshalling
- 4.3.4 Remote object references
- 4.5 Network virtualization: Overlay networks

#### **Chapter 5. Remote Invocation**

- 5.1 Introduction
- 5.2 Request-reply Protocols
- 5.3 Remote Procedure Call (without Sun RPC case study)
- 5.4 Remote Method Invocation

#### **Chapter 6. Indirect Communication**

- 6.1 Introduction
- 6.2.2 Group Communication; Implementation Issues
- 6.3 Publish-subscribe systems

#### **Chapter 8. Distributed Objects and Components**

- 8.1 Introduction

### 8.3 Case Study: CORBA

## **Chapter 10. Peer-to-Peer Systems**

### 10.1 Introduction

### 10.2 Napster and its Legacy

### 10.3 Peer-to-Peer Middleware

### 10.4 Routing overlays

## **Chapter 14. Time and Global States**

### 14.1 Introduction

### 14.2 Clocks, Events, and Process States

### 14.3 Synchronizing Physical Clocks

### 14.4 Logical Time and Logical Clocks

### 14.5 Global States

## **Chapter 15. Coordination and Agreement**

### 15.1 Introduction

### 15.2 Distributed Mutual Exclusion (without Maekawa's algorithm)

### 15.3 Elections

### 15.4.3 Ordered multicast (without implementing causal ordering, overlapping groups, multicast in synchronous and asynchronous systems)

### 15.5.3 The Byzantine Generals Problem in Synchronous Systems

## **Chapter 18. Replication**

### 18.1 Introduction

### 18.5 Transactions with Replicated Data (without virtual partition algorithm)

## **Chapter 20. Distributed Multimedia Systems**

### 20.6.2 BitTorrent

**Notice:** there are several issues discussed at the lectures, which are *not* covered in the textbook. The lecture notes should be sufficiently explicit to understand them.

Some other material related to the course topic:

\* Andrew S. Tanenbaum: "*Distributed Systems*", Prentice-Hall International, 2002, or a newer edition.

\* Mukesh Singhal, Niranjan G. Shivaratri: "*Advanced Concepts in Operating Systems*", McGraw-Hill, 1994, or a newer edition.

\* <http://www.omg.org/> (on OMG and CORBA).