



# LTAT.06.007 Distributed Systems

Course overview

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Tartu, Estonia 08/02/2021

# Course overview

## Basic (Lectures 1-5)

- Architectural styles
- Communication primitives
- Distributed algorithms

## Intermediate (Lectures 5-10)

- Coordination of parallel processing, and mutual exclusion
- Data consistency models and management
- Scalability and performance

## Advanced (Lectures 10-15) – **Invited instructor**

- Fault tolerance
- Replica management
- Recovery

# Course overview

## Theory

Concepts and principles (in lectures)

## Practical work

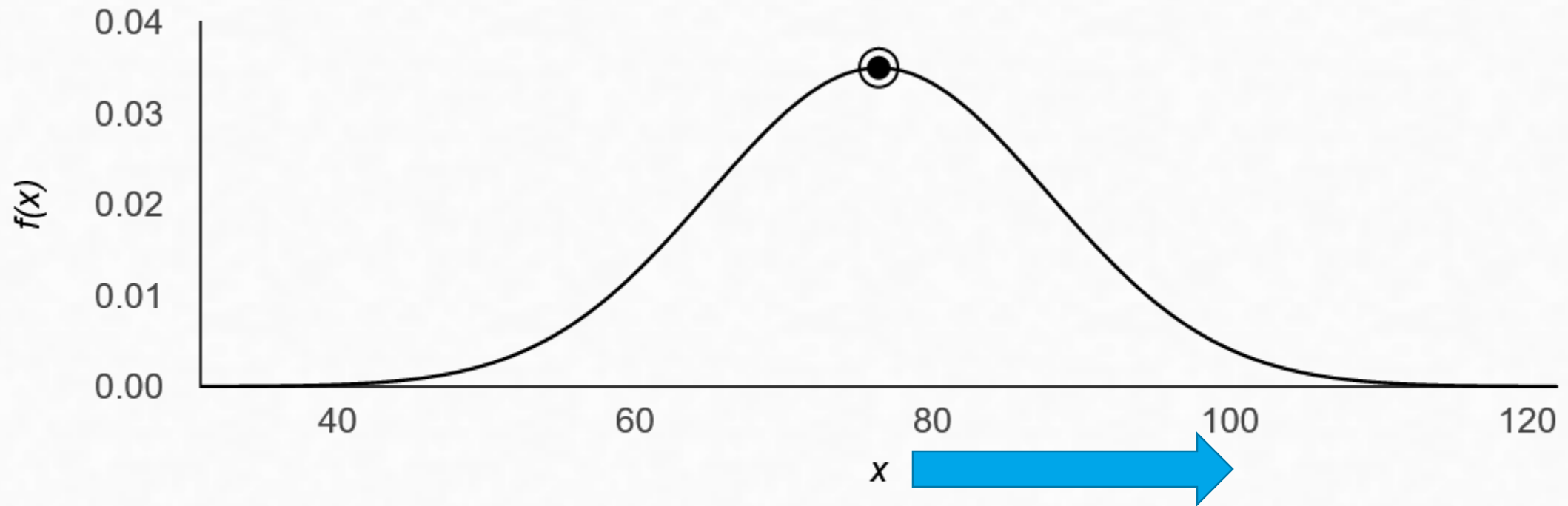
Exercises (in the seminar) – **Farooq Dar and Mohan Liyanage**

## Discussion on emerging topics

Opportunistic computing/communications

Social-aware technologies (5G, Internet of Things, etc)

# Course complexity



$$\mu = E(X) = 76.39 \quad \sigma = SD(X) = 11.4 \quad \sigma^2 = Var(X) = 129.96$$

# Course schedule

- Lecture meetings
  - Monday 10:15-12:00 in Delta, Narva mnt 18 - 1037
- Weekly exercise sessions
  - Seminar (Group 1): Narva mnt 18 – 1022; Wednesday 10:15-12:00
  - Seminar (Group 2): Narva mnt 18 – 1022; Friday 12:15-14:00
- Exam (tentative) – Two options (you can just take one)
  - May 31 / June 7 (TBD)
  - Moodle version
  - There will be time limit
  - Exams are completed individually
    - No digital talks/chats/etc.
- Resit is just available for those that obtained a negative result (Not for grade improvement)

# Course grading (Terminology)



- **Lectures** cover concepts and fundamental aspects of Distributed Systems
  - **Tasks** are assigned during lecture times, and are submitted in a specific deadline (a task is completed by a group)
- **Practical seminars** cover programming and written exercises about a topic, e.g., using JMeter.
  - Practical work must be completed before each Monday (Sunday 11:59)
  - **Exercises** are performed during the seminar. Exercises have to be completed and submitted (at home if seminar time is not enough)  
if you cannot attend the seminar, download the exercises and send them
  - **Quizzes** are also part of the practical seminar. Moodle will be used to conduct the quizzes. **You will have 2 attempts to complete a quiz.**

# Course grading (Terminology)

- Students collect points during the course. *Ongoing results are updated weekly (see course website)*
  - Tasks
  - Exercises + Quizzes
- Bonus points will be available in each task. These points are **optional**, and will not influence your overall grade. However, you can improve your overall task grade with bonus points.
  - **Bonus points are given when the result of that extra work is correct. No bonus points are given for attempts.**
- Be careful with plagiarism (presenting similar tasks/exercises, uncited work)

# Course grading (Summary)

- Exam **40pts**
  - **You need to score half points to pass (MANDATORY)**
- Practical seminar work **60pts**
  - **3 tasks (35pts) – Bonus points (if any) will be announced here**

Within each task is described grading instructions based on implementations of functions and standard answers
  - **Quiz/exercises (25pts)**

**Total = Tasks (35) + Practical (Exercises + Quizzes) (25) + Exam (40)**

**Total = 100** + Bonus (if you have any)



# Course grading

Points collected are then converted into a grade

Grade	Points
A	91-100
B	81-90
C	71-80
D	61-70
E	51-60
F	50 and below

# Course book

**Van Steen, Maarten , Tanenbaum, Andrew.** Distributed Systems: Principles and Paradigms (Third edition). Published by Maarten van Steen, 2017.

[Previous versions published by Pearson]

Free download from <https://www.distributed-systems.net/>

## Other usefull course books:

- **Ghosh, Sukumar.** Distributed systems: an algorithmic approach (second edition). Chapman&Hall/CRC, 2015. Author's own course material, Spring 2015: <http://homepage.divms.uiowa.edu/~ghosh/16615.html>
- **Coulouris, George, Dollimore, Jean, Kindberg, Tim:** Distributed Systems: Concepts and Design [5th Edition], Addison-Wesley 2012

# Expected knowledge, background

Programming skills

Basics of Networking and Data Communication

Layers, protocols, ...

Basics of Operating systems

System calls, APIs, ...

Concurrency and mutual exclusion in single computer

Critical sections, shared memory, ...

# Discussions

The lecture sessions will be based on discussions. Everybody participates.

Step 1: Pair discussion for two minutes,

Step 2: Collect the points together



# Questions?

E-mail: [huber.flores@ut.ee](mailto:huber.flores@ut.ee)

Let's get into it!