Course admin

Lecturer
Dr. Mitra Nasri (m.nasri@tue.nl)
(and Prof. Twan Basten for the lecture on NP-Completeness)

Teaching assistants
Saeid Dehnavi (s.dehnavi@tue.nl)
Pourya Gohari (p.gohari.nazari@tue.nl)

Reference

Materials, updates, and announcements
Canvas and the course “Team” on MS Teams
• Join team: EE_5LIG0 (2021-2022)_Team
• Team code: --------
Logistics

• Lectures
  • There will be at least one lecture per week (some weeks have two lectures)
  • Lectures will be on campus and will not be recorded

• Lab
  • Lab hours are the hours during which you can meet TAs and ask your questions about the assignments. Attendance to the lab is optional.

• Exam
  • Oral exam on campus

• What if you cannot come to campus?
  • We can arrange one-to-one online appointments with the TA (for the lab)
  • It is also possible to schedule the oral exam online.
  • You must explain the situation to the lecturer (Mitra Nasri) to arrange an online exam.
Logistics

• **Communication**
  
  • To communicate with the lecturer and TAs join the Team of the course on **MS Teams**
  
  • You can meet and talk with the lecturer during lecture hours (on campus)
  
  • You can meet and talk with the TAs during the lab sessions (on campus)

• **How to join the course team on MS Teams**
  
  • Open your MS Teams app (login with your TU/e credentials)
  
  • Go to “Teams”
  
  • Join team: **EE_5LIG0 (2021-2022)_Team** using the option “**Join a team with a code**”
  
  • Enter the team’s code: -------
Logistics

• **The course follows a “blended education” style**
  - You watch pre-recorded lectures (basic concepts)
  - Then you come to campus and attend an “**interactive lecture**” which contains a lot of **exercises** and **Q&A**, and introduce more **advance topics** with **examples**.
  - Course materials will be provided on [Canvas](https://www.canvas.net)

• **Communications**
  - Meet the TAs during the lab hours
  - Meet the lecturer during the lecture hours
  - To communicate outside of the lab and lecture hours, use **MS Teams** of the course EE_5LIG0 (2021-2022) Team
Course’s Team EE_5LIG0 (2021-2022)

• Channels:

  • A discussion channel for each assignments
    – You can ask your questions about each assignment here from the TAs. They will do their best to answer your questions as soon as possible.
    – When needed, TAs will create a private channel to discuss with you individually

  • A discussion channel for any question related to the lectures

  • General information/questions

  • Off topic
Lectures (on campus)

• Lectures are mostly on Mondays
  • A few lectures will be on Wednesdays (follow the schedule on Canvas)
  • You will need to prepare before coming to the lectures (you should watch short videos which will be provided for you before the lecture)

• Lectures include:
  • **Exercising and solving new problems** with techniques taught in the pre-recorded videos
    − Some of the exercises are in group
    − Get **cookies** for your interesting solutions!
  
• **Q&A**: where you can ask your questions about the lecture contents or exercises

• **Advanced topics** beyond the short videos will also be presented during the lecture slots
Assessment

- **Assignments**
  - Assignments are mini-projects that allow you to get involved with problems similar to those found in industry
  - Each assignment has a set of deliverables (report + code)
  - Assignments are individual and can be done in any programming language that you are comfortable with.

- **Quizzes**
  - There are 4 quizzes
  - You have 2 tries on each quiz.
  - Your last try will be considered for grading.

- **Oral exam**
  - The oral exam is about the course contents, assignments, and quizzes
Assessment

- Assignment 1
  - Graph analysis (40%)

- Assignment 2
  - Peer review of Assignment 1 (10%)

- Assignment 3
  - ILP (15%)

- Assignment 4
  - NP-Completeness (25%)

Submitting all assignments and quizzes before the deadline is mandatory to pass the course!

- Quiz 1: Divide and conquer + complexity
- Quiz 2: Graph analysis
- Quiz 3: Dynamic programming and greedy algorithms
- Quiz 4: ILP and NP-Completeness

Quizzes (all together) are 10% of the grade

The oral exam will be mainly focused on your assignment reports, quizzes, and if needed the course materials.
Learning objectives and topics

At the end of the course, you should be able to understand, apply, and evaluate algorithmic solutions for various problems in embedded and/or cyber-physical systems.

Topics covered

• Big-O notation and complexity
• Divide-and-conquer algorithms
• Graph analysis
• Greedy algorithms and minimum-spanning tree algorithms
• Dynamic programming
• Linear and integer-linear programming, and network flow
• NP-completeness
• Coping with NP-completeness using approximation

How to evaluate and compare algorithms

Design efficient algorithms to solve optimization problems

Use automated tools to solve optimization problems

Learn about and cope with problems that are inherently “hard” to solve
**Schedule**

- **Official time slots:**
  - Mondays 13:30 to 15:30 and Wednesdays 8:45 to 10:30

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<th>wk</th>
<th>date</th>
<th>classes</th>
<th>location</th>
<th>study material (on Canvas)</th>
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