Course manual EHT 24/25

Course Setup

The Energy & Heat Transfer course covers the basics of energy, energy efficiency, and the three heat transfer mechanisms: conduction, convection, and radiation. You will have eight lectures, including a summary, and seven tutorials held on campus. There are also self-learning sessions where you can study at your own pace. All the necessary information can be found on TimeEdit, so make sure to check it regularly for any updates.

After the lectures, you will tackle some HeatQuiz questions related to what you have learned. During the tutorials, we will discuss the week's topic together, and then you can work on additional exercises. Our student assistants will be there to help you out if you have any questions. If you complete specific exercises and they meet the requirements, you can earn bonus points toward your final grade. However, please note that the evaluation will be done only if you submit the paper; no submission means no evaluation, and hence, no grade.

Once the tutorial is over, it's time to focus on the weekly group assignment. You will have about a week to complete it, and the exact deadlines can be found below. We have also set up a discussion page on Canvas where you can ask questions about the exercises, assignments, and HeatQuiz. Depending on the number of questions posted, we may organize some online Q&A sessions, which we will announce in advance.

The course wraps up with a written exam. For specific dates, grading weights, and details about all the assignments and deadlines, check out the information provided below.

Schedule

Location: Check timetable

Lectures and tutorials	
LEC 1 – Mon 09 Sep: 13:45 – 15:30 Introduction, organization; work, energy, power, units	TUT 1 – Tue 10 Sep: 08:45 – 10:30
LEC 2 – Wed 11 Sep: 13:45 – 15:30 Efficiency, electricity; heat transfer through conduction	TUT 2 – Thu 12 Sep: 13:45 – 15:30
LEC 3 – Mon 16 Sep: 13:45 – 15:30 Heat transfer through forced convection	TUT 3 – Thu 19 Sep: 13:45 – 15:30
LEC 4 – Mon 23 Sep: 13:45 – 15:30 Heat transfer through natural convection	TUT 4 – Thu 26 Sep: 13:45 – 15:30
LEC 5 – Mon 30 Sep: 13:45 – 15:30 Heat transfer through radiation	TUT 5 – Thu 03 Oct: 13:45 – 15:30
LEC 6 – Mon 07 Oct: 13:45 – 15:30 Combined heat transfer	TUT 6 – Thu 10 Oct: 13:45 – 15:30
LEC 7 – Tue 15 Oct: 08:45 – 10:30 Time-dependent heat problems	TUT 7 – Fri 18 Oct: 13:45 – 15:30
LEC 8 – Fri 18 Oct: 10:45 – 12:30 Summary of all lectures	

Course Deliverables

I **Complete HeatQuiz quizzes**
To prepare for each lecture and the subsequent tutorial, it is recommended that you solve the HeatQuiz quizzes. Please note that HeatQuiz is an additional tool for learning and is not mandatory; however, there might be questions from HeatQuiz quizzes in the final exam. Engaging with the quizzes can enhance your understanding and better prepare you for the exam. Ensure that you play all quizzes using your student number! More information about the HeatQuiz can be found in the 'HeatQuiz' section.

II **Hand-in assignments during the tutorials**
During the tutorial sessions, we will work on solving questions from the tutorial bundle. You are encouraged to discuss these questions with your fellow students. However, please note that the completed hand-in exercise will be individually checked at the end of the tutorial. By actively participating in all tutorials and successfully completing the hand-in problems during these sessions, you have the opportunity to earn an **additional 10% on top of your final grade (submission of papers is mandatory for evaluation)**.

III **Submit group assignments (Weekly)**
The weekly assignments are located in the W-blocks on the HeatQuiz learning path. Before attempting the weekly assignment, it is recommended to complete the exercises in the exercise bundle of the corresponding chapter. This will give you a better understanding of how to solve similar problems. The weekly assignments are meant to be completed with your project group, and you can submit them via Canvas. Please designate one student from your group to submit the assignment and include the names of all group members in the submission.

To ensure clarity and legibility, it is required to document the weekly assignments using word-processing software such as LaTeX or Word. **Handwritten submissions will be considered insufficient and may not be accepted.**

The deadlines for the weekly group assignments are:

- Deadline assignment W02: Thursday 19 September at 23:59
- Deadline assignment W03: Sunday 29 September at 23:59
- Deadline assignment W04: Thursday 03 October at 23:59
- Deadline assignment W05: Thursday 10 October at 23:59
- Deadline assignment W06: Thursday 17 October at 23:59
- Deadline assignment W07: Friday 25 October at 23:59

Note that the deadlines are strict. **Late submissions will not be graded.**

IV **Examination**
The examination will be held on **Friday, 08 November 2024, from 08:45 to 11:45.** The exam will be available on the exam date, from the designated time. A simple calculator is allowed **(so no graphic calculator)**. You can bring the lecture slides, hard copy notes, **but no solutions**, and, optionally, the books stated in the references of this manual to the exam as well. Do not forget to bring your student card to the exam!

V **Resit**
The resit will be a written exam. It is scheduled on **Thursday, 21st of November 2024, from 08:45 to 11:45.** The resit is for those who did not get a sufficient grade (Final Exam + Weekly Assignments + Tutorial Bonus).

Assessment

To pass the course, it is required that the minimum final grade is at least 5.5. The final grade consists of the following parts:

- 80 % for the final exam (individual mark)
- 20 % for the weekly assignments (group mark)
- **Bonus (10% of final grade):** Bonus points can be earned individually by completing the hand-in exercise during the tutorial **(submission of papers is mandatory for evaluation)**.
  - **The bonus is only valid for the 1st exam and it is not counted for the resit exam**.

HeatQuiz

HeatQuiz is a game-based learning application for learning heat and mass transfer related concepts. During the course, a learning path in HeatQuiz specific to the course will be used. In this learning path, each week a few different 'blocks' are present:

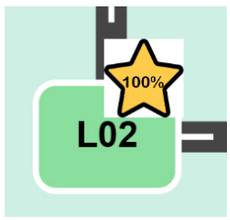

Figure 1: Star in HeatQuiz indicating the succes rate

- The L-blocks denote a lecture. Within this block, the lecture slides can be found as well as the corresponding quiz of that lecture. Completing HeatQuiz exercises and scoring 80% of the exercises correctly gives access to the T- and S-blocks. The rate with which a question series has been solved is indicated by use of stars (in steps of 20/40/60/80/100) as can be seen in Figure 1.
- The T-blocks denote tutorials, with tutorial exercises.
- The S-blocks denote solutions to the tutorial exercises.
- The W-blocks denote the weekly assignments.

How to play with your student number?

The map is accessible via `http://167.86.98.171:3000/#/Courses/PlayMapWithKey/91`. When playing for the first time the message "Please add a key!" will appear. This has to be done by pressing the green button "Assign new key". A box will pop up in which a key has to be entered. This key must be your student number, e.g. s1234567.

How do I check if I am playing with my student number?

It is important to occasionally check if you are playing with your student number, to prevent problems in the future. The red arrow in Figure 2 shows with which student number you are playing. If it shows your student number everything is fine. If not, you should change it to your student number.

How do I change my student number

If you have entered something differently than your student number, the green box "Assign new key" in Figure 2 can be used to still change it to your student number. A box will pop up in which a key has to be entered.

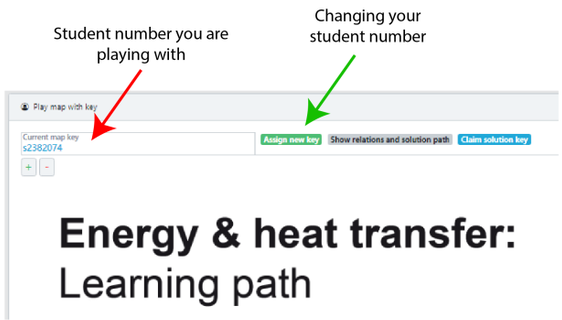

Figure 2: Checking your student number and changing it if needed

Organization

Teacher

- Dr. Mohammad Mehrali (HR-N224, m.mehrali@utwente.nl)

Teaching Assistants

- Abolfazl Nematpourkeshteli (a.nematpourkeshteli@utwente.nl)
- Saket Sahu (s.sahu@utwente.nl)

Books for reference

1 Y. A. Cengel & A. J. Ghajar. Heat and Mass Transfer: Fundamental & Application.

2 F. P. Incropera & D. P. DeWitt. Introduction to Heat Transfer.