Course manual

Course Setup

The course Energy Heat Transfer provides the fundamentals in the area of energy, energy efficiency and the three heat transfer mechanisms (conduction, convection and radiation) in seven lectures (including one summary of lectures) and six lectorials (on campus). There are also 5 sessions for self-learning which are unsupervised. All data can also be found in MyTimetable. **Check this regularly for any changes.**

After the lectures, a small number of questions corresponding to the thaught content in HeatQuiz should be solved. After this, during the lectorials, an exercise on that weeks topic will be discussed together, after which you can work on the other exercises. Student assistants will be present to help when you have questions. If you finish the exercises you can check them with the student assistants, and if determined to be sufficient, earn bonus points on your final grade. After the lectorial, the group weekly assignment should be made. The deadline for the assignment is generally a week later, the exact dates can be found below. Furthermore, a discussion page will be opened on Canvas, where you can ask questions regarding the exercises, the assignments and HeatQuiz.

The course is finalized with a written exam. For the dates and weights of all deliverables and deadlines, see below.

Schedule

Location: Check timetable

Lectures and Lectorials	
LEC 1 – Tue 06 Sept: 13:45 – 15:30 Introduction, organization; work, energy, power, units	*TUT 1 – Fri 09 Sept: 13:45 – 15:30
LEC 2 – Thu 08 Sept: 10:45 – 12:30 Efficiency, electricity; heat transfer through conduction	*TUT 2 – Thu 15 Sept: 13:45 – 15:30
LEC 3 – Tue 13 Sept: 13:45 – 15:30 Heat transfer through forced convection	*TUT 3 – Thu 22 Sept: 08:45 – 10:30
LEC 4 – Mon 19 Sept: 08:45 – 10:30 Heat transfer through natural convection	*TUT 4 – Thu 29 Sept: 08:45 – 10:30
LEC 5 – Tue 27 Sept: 13:45 – 15:30 Heat transfer through radiation; Combined heat transport	*TUT 5 – Thu 06 Oct: 13:45 – 15:30
LEC 6 – Tue 04 Oct: 13:45 – 15:30 Time-dependent heat problems	*TUT 6 – Thu 13 Oct: 13:45 – 15:30
LEC 7 – Tue 11 Oct: 13:45 – 15:30 Summary of all lectures	

*) For these lectures the group will be split. More details will be made available later on.

Self-learning sessions/Unsupervised	
Thu 15 Sept:	15:45 – 17:30
Thu 29 Sept:	15:45 – 17:30
Thu 06 Oct:	15:45 – 17:30
Thu 13 Oct:	15:45 – 17:30

Course Deliverables

I **Complete HeatQuiz quizzes & assignments (Lectorials)**
As preparation, after each lecture and before the lectorial where the content of that lecture will be discussed, the HeatQuiz quizzes should be solved with a minimum succes rate of 80 %. Furthermore, during the lectorial sessions, questions from the tutorial bundle will be solved individually. You are allowed to discuss with your fellow students, but the finished assignments will be checked individually at the end of the lectorial. By solving the HeatQuiz quizzes, attending all lectorials and solving the stated problems during these sessions you can earn an extra 10% on top of your final grade. The lectorial sessions are not mandatory, but it is highly recommended to attend these sessions! For the HeatQuiz quizzes, it is important that you did share your user key. See the section 'HeatQuiz' for more information.

II **Submit group assignments (Weekly)**
The weekly assignments can be found under the W-blocks on the HeatQuiz learning path. Make the exercises in the exercise bundle of a chapter before making the weekly assignment, to get an idea of how to solve such a problem. The weekly assignments should be done with your project group. The assignments can be submitted via Canvas. One student per group can hand in the assignment, please provide the names of the members of your group in the submission.

The weekly assignments should be documented by use of a word-processing software (e.g. LaTeX or Word). Submissions that are handwritten will be considered to be insufficient.

The deadlines for the assignments are:

- Deadline assignment 1: Friday 16 September at 23:59
- Deadline assignment 2: Friday 23 September at 23:59
- Deadline assignment 3: Friday 30 September at 23:59
- Deadline assignment 4: Friday 7 October at 23:59
- Deadline assignment 5: Friday 14 October at 23:59
- Deadline assignment 6: Friday 21 October at 23:59

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

III **Examination**
The examination will be held on **Monday, 7 November 2022, from 8:45 to 11:45**. The exam will be available on the exam date, from the designated time. The use of 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!

IV **Resit**
The resit will be a written exam. It is scheduled on **Monday, the 25th of November 2022**. The resit is for those who did not get a sufficient grade (Final Exam + Weekly Assignments + Lectorial).

Assessment

To pass the course, it is required that the minimum final grade is at least a 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 through the completion of exercises in HeatQuiz and completion of an assignment during the lectorial. In order to be elegible for the bonus, each week a number of exercises needs to be completed with a pass rate of at least 80%. To keep track of HeatQuiz performance, you need to **keep track of and submit your HeatQuiz key(s).** See the section 'HeatQuiz' for further information.
  - 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:

- The A-blocks denote relevant theory during the week. The first section contains learning activities before each lecture, the second section contains the notes of that corresponding lecture and the third section contains learning activities after each lecture.

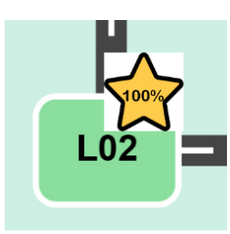


Figure 1: Star in HeatQuiz indicating the succes rate

- 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 serie has been solved is indicated by use of stars (in steps of 20/40/60/80/100) as can be seen in Figure 1. If a star of 80% or 100% is obtained within the specified time slot for that bonus point, it implies that this bonus point was successfully obtained.
- The T-blocks denote tutorials, with tutorial exercises.
- The S-blocks denote solutions to the tutorial exercises.
- The W-blocks denote the weekly assignments.

Bonus points can be earned through the use of HeatQuiz. This requires completing a sufficient amount of bonus exercises correctly (80%) each week, within the allowed time frame. **This time frame runs from the end of a lecture until the beginning of the accompanying tutorial.** In order to keep track of HeatQuiz performance, it is important to submit personal HeatQuiz key(s). Because one student can have multiple HeatQuiz keys due to using different devices and browsers, multiple keys may be submitted. Use this form to submit HeatQuiz keys. See the table below for the exact start and end time/date for each bonus point time slot.

Bonus point exercises time slots	
Week 1 (L01)	06 Sept. 15:30 - 09 Sept. 13:45
Week 2 (L02)	08 Sept. 12:30 - 15 Sept. 13:45
Week 3 (L03)	13 Sept. 15:30 - 22 Sept. 08:45
Week 4 (L04)	19 Sept. 10:30 - 29 Sept. 08:45
Week 5 (L05)	27 Sept. 15:30 - 06 Oct. 13:45
Week 6 (L06)	04 Oct. 15:30 - 13 Oct. 13:45

Organization

Teacher

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

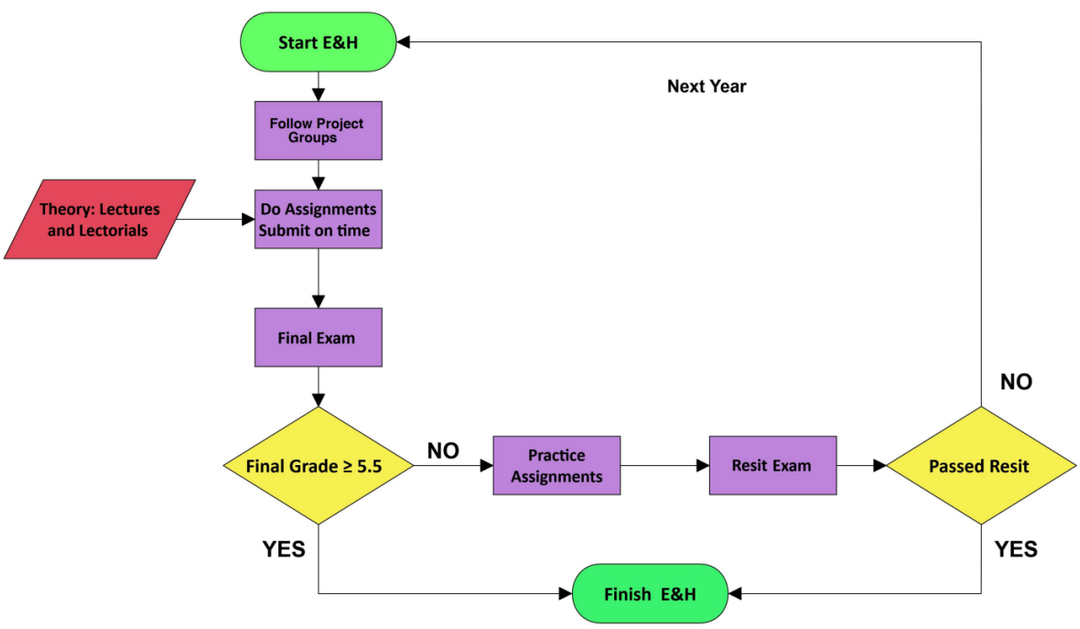
Teaching Assistants

- Daan Kuiphuis (d.j.g.kuiphuis@student.utwente.nl)
- Hidde van der Bijl (h.g.vanderbijl@student.utwente.nl)
- Jochem den Os (j.c.denos@student.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.


Start E&H
Next Year
Follow Project Groups
Theory: Lectures and Lectorials
Do Assignments Submit on time
Final Exam
Final Grade ≥ 5.5
NO
Practice Assignments
Resit Exam
Passed Resit
NO
YES
YES
Finish E&H