# Project Work

The course will finish with a project work, which brings all the subtopics together into a single work package. The project work will be the main factor in grading the HTML+CSS topic and has small impact on math and programming grades.

## Project Teams

This project will be done using max three person teams. It is not possible to have more persons in a team. Notice that the project can also be done as a pair or solo. When you have your team formed, contact Lasse Haverinen (lasse.haverinen@oamk.fi)

## Deadline & Presentations

The project deadline is Wednesday 18.12.2019. In addition to submitting the project deliverables, each team will present their work to teachers and class on 18.12.2019 starting at 12:00. Don't be late! The maximum duration of the presentation is 5 minutes (strict limit).

The team must prepare for the presentation so that the team is immediately ready to present when it is their turn.

* Get your demo loaded,
* check beforehand that your computer has a compatible video output and TEST IT
* make sure that your presentation slides are open and check all other necessary things for your presentation.

We want the minimum amount of delays between teams. With for example 20 teams and just 2 minutes time between the presentations make a total of 40 minutes just waiting. So make everything ready!

## Deliverables

Every team will open a public repository in GitHub and all project deliverables will be stored there. Name your repository "DevBasicSkills2019-TeamNumber".

### Code

The full implementation of the team's work must be available in the repository. All assets used by the project must be available.

### Documentation required

**Time Tracking Sheets**

Project team will track their working time on daily basis. Each team member records their work time and writes a short description of activities.

**Project Poster**

The poster describes the project and its results.

## Project Work Description

Your task is to design and implement a web based mathematics tool.

The tool should offer six different math functionalities for the user.

The math functionalities are listed below.

1. Number system conversions

Create a tool for numbering system conversions. The tool must contain at least the four numbering systems: BIN, OCT, DEC, and HEX. Additional requirements: Input validation. (Example: a bin input may contain only 0s and 1s, otherwise a user is informed).

1. Number system outputs

Create the JavaScript code necessary to print a table showing decimals 0-50 in BIN, OCT and HEX systems. Implement a button, which prints the table to the page and a button which removes it. Do the printing and removing with actual DOM element operations so that the necessary elements are created and deleted instead of just for example CSS manipulation of for example display property.

1. Combinatorics

Create a simple tool for Combinatorics.

The tool is used to calculate either combinations or permutations. In the case of permutations, also the choice of sampling (sampling without or with replacement) must be taken into account. Additional requirements: Disable sampling options if combinations were chosen.

1. Truth tables

Create the basic set of truth tables for basic operations. Study the basic truth table symbol character codes (HTML / Unicode etc.). Use Booleans (true and false / 0 and 1).

1. Random values

Create a tool to test random number distributions. Choose any range of numbers (integers or decimals) and classify the values. The tool should have input fields for entering the range of numbers and an input option for entering how many random numbers should be generated. Show the distribution of the generated numbers.

1. Design your own (optional)

Choose any mathematical discipline and create functionality for it.

## Grading

Each subtopic of the project and course will be evaluated separately and the overall grade of the course will be determined by the combined evaluations.

The subtopics, their weights (in ECTS credits) and grading criteria are the following:

* HTML and CSS Programming (3 ECTS)
  + Project work implementation quality
    - Code Structure
    - Code Cleanliness
    - User experience
* Web User Interface Design and Usability (3 ECTS)
  + Graded design exercise
* Computing Mathematics (3 ECTS)
  + Project work requirements fulfillment
  + Exam
  + Online tasks
* Object Oriented Programming (3 ECTS)
  + Exam
* Professional English Communication (3 ECTS)
* Given separately by english teacher

Each subtopic will be graded on a 20 point scale. The total amount of course points is 100 points. You will also get a separate 0-5 grade from English.

Points-grade relationship:

* Grade 5, 87p or more
* Grade 4, 75p or more
* Grade 3, 55p or more
* Grade 2, 40p or more
* Grade 1, 20p or more