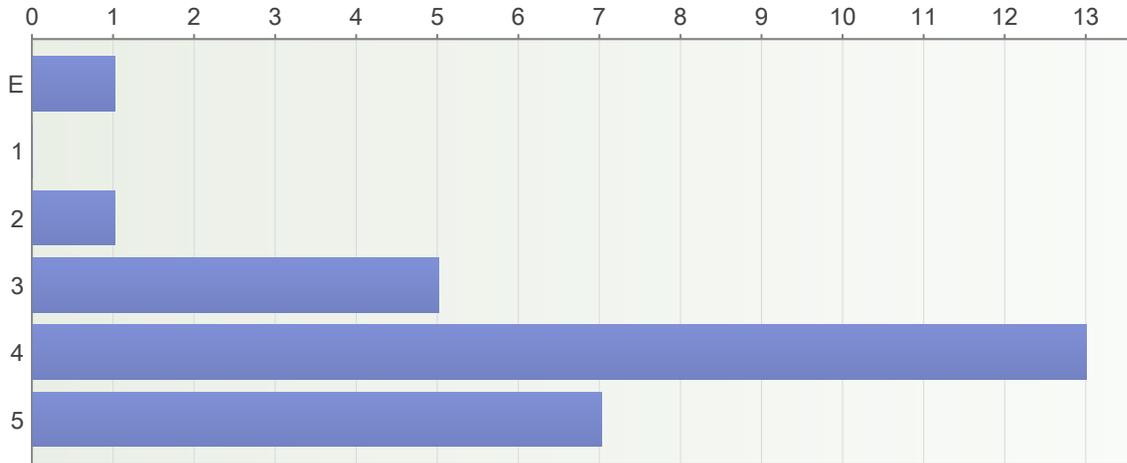


MS-E1000 Crystal Flowers in Halls of Mirrors: Mathematics meets Art and Architecture (2017-01-03 - 2017-05-31)

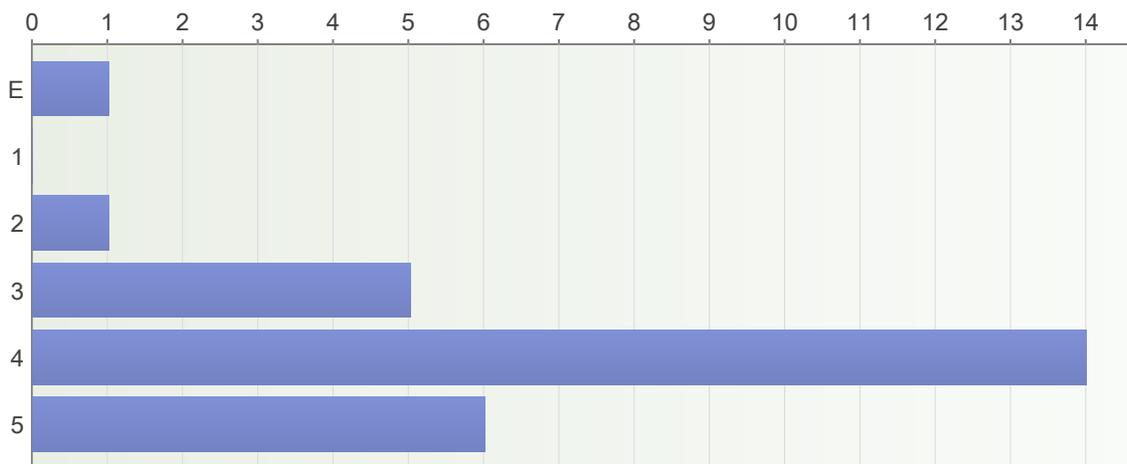
1. My overall assessment of the course E=Not applicable, 1=Fair, 2=Satisfactory, 3=Good, 4=Very good, 5=Excellent

Number of respondents: 27



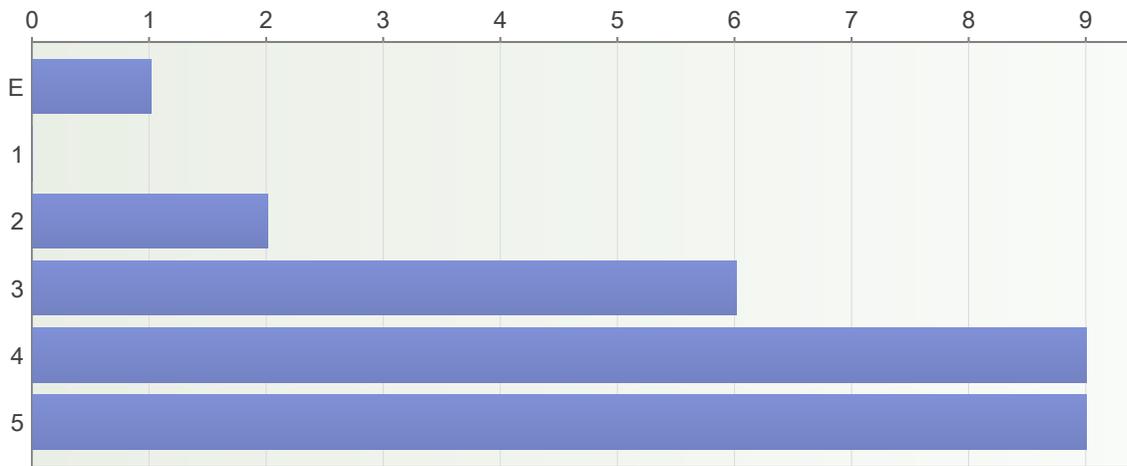
2. The teaching methods (lectures, labs, group work, online study, assignments etc.) supported my learning E=Not applicable, 1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree

Number of respondents: 27



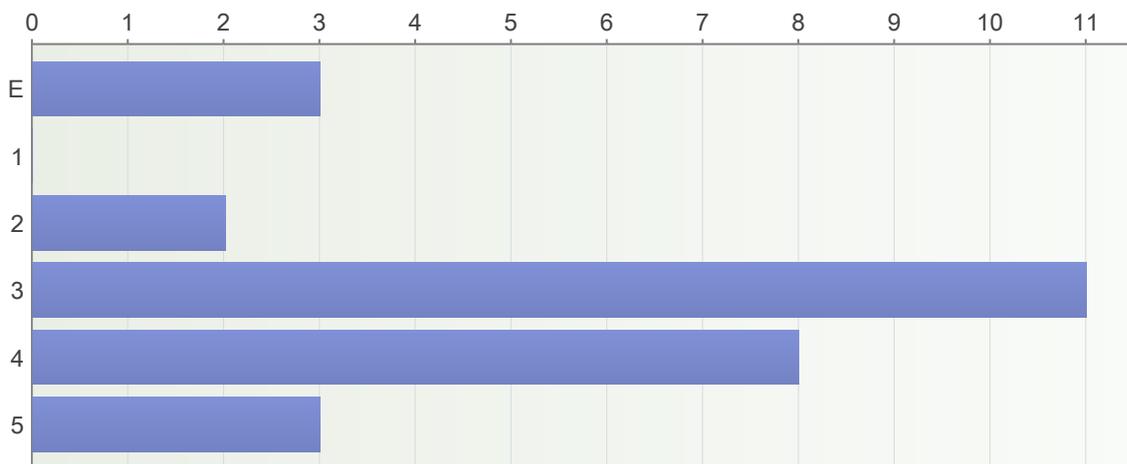
3. I am pleased with my study effort on this course E=Not applicable, 1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree

Number of respondents: 27



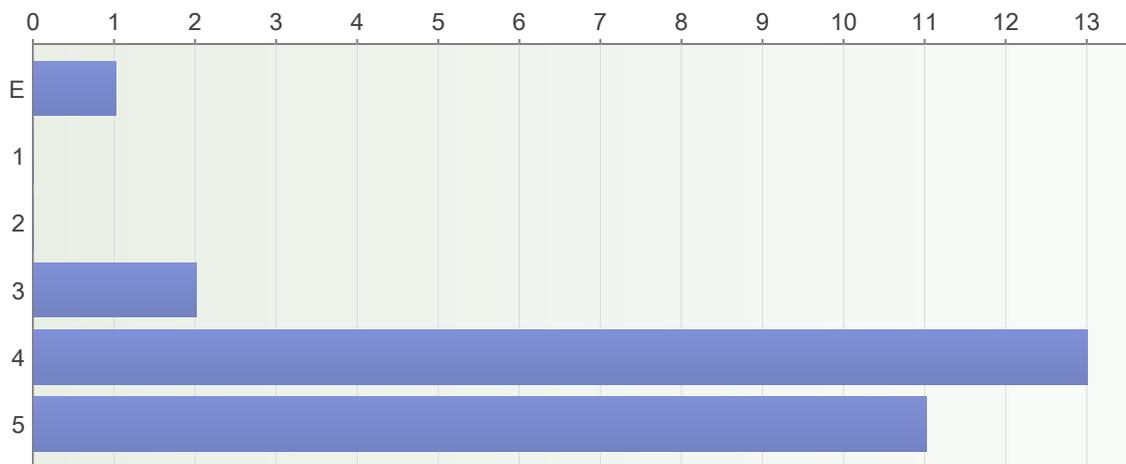
4. According to the guidelines, one credit (ECTS) requires 27 hours of student work. Compared with this, the completion of the course required E=Not applicable, 1=Considerably less time, 2=Slightly less time, 3=The right amount of time, 4=Slightly more time, 5=Considerably more time

Number of respondents: 27



5. I think I will benefit from the things learnt on the course. E=Not applicable, 1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree

Number of respondents: 27



6. What was good about the course? Which factors in particular supported your learning?

Number of respondents: 25

- Really motivated and inspiring teachers. Practical work.
- Broad subject range and excited teaching.
- Different lecturers, also visiting ones.
Holistic approach to the subject.
- Mathematics and arts course is an interesting concept. it always stretches my thinking abilities to beyond than before. I like the course most, it shows the art in a new perspective. Eventhough it's tough to think everytime out of my thinking abilities, at last everything paid off with what I learned from this course.
- The multidisciplinary and intercultural situation
- Workshops were fun
- I liked the mix of practical exercises and lectures devised for the course.
- The mathematics covered in the course was inspirational. Also the collaboration with Heureka was nice touch: it's nice to have own piece in Heureka!
- All the hands on work were great. Also liked the lectures on 4th dimension and hyperbolic spaces.
- The unusual topics combinig math and art as well as the amount of freedom in granted in the course works.
- This course is very unique, it includes a lot of group work. And provide us a great platform to create artwork related to mathematics. The lectures are also very inspiring, teachers are come from different background, so we can get fresh knowledge every week. For example, after one course related to coding, I got very interested and I take another course to learn programming. There's many great aspects of this course and the teachers are very supportive for our learning. I didn't miss any lecture of this course and I feel sad when it's end.
- Group works were interesting and I think that working in such a multidisciplinary team was a super valuable experience.
- Multidisciplinarity, all the people from different backgrounds, teachers and their methods, workshops and hands-on-tasks during the lectures (folding stuff, straws etc.). Tutoring with Marco and Tuula was excellent and really beneficial. Altogether, the whole course was really interesting and I believe that I learned a lot. I really hope that we'll have some kind of informal after-the-course meeting during the spring or summer!

- The dialogue between the various disciplines. This made it very diverse. Looking at things from different perspectives is very enriching and definitely supports learning a lot.
- I loved the ludic way of teaching something that I've always learned in a boring way.
- Good things were the workshop kind of learning. The lectures combining math with art were interesting. Overall the course was a good experience!
- Topics were really interesting. And I noticed that I really did understand some things in the end of the course. First dimensions and some other things were really hard to handle, but learned step by step. It was also very nice to notice that lecturers were really trying to find different angles so people outside architecture and mathematics were able to understand. Some of the homeworks were too difficult for me, but I was trying my best.
- The course was very different from other courses that I have taken before (in Aalto and in my previous university), and that makes it a unique and inspiring experience. Some of the things that I found great are:
 - Several professors guided us through the learning process, each of which contributed to the diversity of the topics and learning methodologies.
 - The lectures always included a segment in which we would do some active work instead of passively listening, therefore we were not only learning but socializing through work and having fun.
 - It was a unique experience to work in a group with people from different careers: I learned lots of things from my team mates and found new interests.
 - The project of creating a work of art in a team was the best thing about the course, I learned an incredible amount from this. We would think intensely about what to create, do several presentations about the idea, and finally build it ourselves. Experiencing the whole process of creating something, from a vague idea to a complete work of art is amazing.
 - Another great thing about the course was having a guest lecturer. Henry Segerman was absolutely inspiring.
 - Finally it is very lucky to have a budget like the one we had to create our work of art.
- Some of the lectures and exercises were good for learning and understanding the concepts of the course.
- There were many topics related loosely together, but almost everything was very interesting. Homeworks and learning by doing during the classes was the best way to learn for me. It was really important that there was creative freedom to make some of the homeworks. It was very motivating and personally I was so excited to find an artistic flow.

I've been missing mathematics for years, especially this kind of math. Now I have some tools and I found a path. The course has changed my life.

- Overall the course was very nice, for the most part the lectures were interesting and most of all inspiring. It was really nice to work in a multidisciplinary environment and meet a lot of new people.

The lectures by Henry Segerman were excellent.

Building the piece was pretty challenging but in the end it turned out alright, and the help we received was mostly pretty good.

- Interdisciplinary students
- Overall the organization and progress of the course was excellent. I like all the classes and the effort that all the lecturers put into it. The talk/workshop scheme they use almost every class was very useful, helping us to reinforce via the workshops what they show us in the talks.
- The hands on part were very good, it helped to understand the mathematical concepts. Having guest lecturers like Henry Segerman really good, and in general having people lecturing about the topics they really care about made the lectures nice. Also the fact that plenty of further reading and references were provided for all topics which makes it easier to start looking for more information.
- The variety of lecturers made the course engaging throughout. The hands-on-exercises and workshops were good and enhanced the learning process.

7. What needed improvement on the course? Which factors complicated your learning?

Number of respondents: 24

- A bit too much work at times, the essay is unnecessary.
Woul have liked a bit.more.help with the actual building during the course. Maybe a space where we all could work with teachers would have been good.
Planning the art piece could have started earlier.
- More workshops and perhaps concentrating more on fewer subject matters.
- Perhaps some written material could support learning the things which went too fast on lectures?
- The introduction classes are little bit uneasy for me as non-arts student. It does not go smoothly in the earlier classes. For me, it sometimes lacks the big picture of the particular lecture to cope up with the topic. Else, everything is effective in teaching methods.
- Better flow of information would be useful in the future:)
- Didn't find reporting after each session very appealing to pursue . somehow, it felt frustrating going through that after writing a few notes for the first few sessions
- The explanation of the mathematics was sometimes too technical for an average listener and felt more like they were aimed for an amateur mathematician. In the couple first weeks I had no idea of where the course is aiming.
- There is quite a lot of written work from reflections to essays and homework. I feel like I had way more than everyone else also because of doing all the lectures/workshops for fabrics and the 6m fabric dying.
- I would have loved to see what more practical applications on the topics discussed during the course.
- Kirsis lectures on the mathematics side were hard to comprehend, and felt like they needed a significant background in the subject so understand, so they went over my head for the most part.
- Maybe the course could add more lectures on mathematics, because the ones already exist now are very interesting.
- More detailed feedback during the first half of the course would have been good. The presentations that we had at the DF were ok and good but the situation was kind of "X-Factor USA" or "Idols" with judges giving "feedback". The feedback was acutally ok but it was impossible to remember and reconstruct after the presentation because one could not write it down or discuss about it at the moment of getting the feedback. There were quite lot of small assignments coming in in fast pace so it was really easy to get late of the schedule of deadlines.
- Interaction between the participants outside their dedicated groups. More peer to peer work. I would also be interesting to think the arts and math side more together rather than splitting it into different lectures...
- I think it is too long and very time consuming. Maybe it will be good if they leave less assignments or for example the last essay I think it was unrequired. It didn't help in anything except having more homework. Overall I loved the course but at the end it was getting a bit heavy.

Kiitos for everything!

- I think we were grouped too much with the same groups, like the whole course was a big groupwork with the same people. maybe some more individual work would be nice. Sometimes the mathematical content was a bit too overwhelming and yelded for prior knowledge on the matters. I was expecting to learn more about the basics of art and conceptual thinking as those were needed for the artwork. There were more things to learn for design students that for technical and math majors, so maybe balance this somehow?
- Course was in a way too long. Complicated topics of course needs time to be explained, but in the end I found that for me the arrangement was not the best. In the beginning I was hoping more talking about the installation, because in the end I was not able to concentrate to the lectures that much. We also had lots of problems inside our group during the spring. Some of the members were not motivated at all and didn't give any effort, so in the end I would say that the workload was really unfair. It also caused that I wasn't so motivated to write reflections in the end. So the working hours i lost in basic course tasks I did with the installation. That's why it is difficult to say if the working hours and credits are matching or not. Would it be better to build the groups during the course based on everyones interests to keep all the students motivated? And in the end it was pretty strange that lectures and installation were two separate parts of the course. It would be better to pull them more

together somehow.

- I would like to refresh the topics of the lectures a bit. It becomes a bit boring when you are lectures usual topics like fractals many times.

I would give more importance to the project of creating the work of art: start earlier, have more presentations, have more guidance. It would result in more carefully thought artworks.

- A lot of the more theoretical stuff were taught in a really mathematical and difficult way. Some of the mathematical stuff could maybe be explained more superficially.
- Some of the theoretical math classes was bit difficult to follow. Clear examples and demonstrations would make it easier.

We had really nice group and we are going to hang together also after the course, but in the beginning the group dynamics and spirit was bit lost. I don't know is there anything what can be improved. Maybe more relaxed time in the beginning to get to know each others. Also group of six students is quite big. In my opinion four students would be ideal.

- The 2d tilings and symmetries were studied for far too many lectures. I'm sure there exists a myriad of topics that could've been put in place of two or three of these lectures.
- Going into topics in a little more depth.
- The only problem from my point of view is that the course was so long. I understand that its length was intended for covering 15 credits, but it took a lot of time from me
- The course focused on topology and geometry, but it would be interesting to see if one could bring similar connections to number theory or more abstract areas. The reflection after every lecture were bit too much, perhaps weekly one would work better. Also the essay could benefit building the final piece if it is done during the prototype period, but then maybe week or two more before the final pieces need to be ready would be good.
- The content of the course could be expanded beyond the visual arts to conceptual media art, music etc. The course could also benefit from questioning and analysing the purpose of mathematics in art instead and more art theory could be implemented in the course.