

| | | | |
|---|---|-------------------------------|-----------|
| Kursens namn | Datorbaserade produktutvecklingsverktyg, grundkurs | Kurskod | ML1209 |
| Kurspoäng och poäng fördelat på examinationsform | 7,5hp CAD1 (inlämningar) = 3,0hp PROA (projekt) = 1,5hp DEXA (examination) = 3,0hp | När kursen genomfördes | VT2021-P4 |
| Kursansvarig | Mark Lange (mlange@kth.se) | | |
| Examinator | Mark Lange (mlange@kth.se) | | |
| Övriga lärare | | | |
| Kursupplägg <ul style="list-style-type: none"> • Kort beskrivning över kursen upplägg och innehåll • Läraktiviteter inkl. antal timmar | <p><u>English</u></p> <p>The entire course was delivered online (ZOOM). This course is an introduction in the use of a computer-based tool in the design and documentation of product concepts using OnShape (KTH Enterprise Onshape, kth.onshape.com), a web-browser based CAD application. The course term is divided into five topic modules; 1) Reading Technical Drawings, 2) 3D Part Modeling, 3) Drawing Automation, 4) 3D Assembly Modeling and 5) Project. Each topic module is started with a lecture on the scope of the module (2-3 hours per week), which is supported with a specialist-lead online lecture (3 hours / week) presenting the practical application of OnShape. Lectures are intended to clarify how to execute assignments to fulfill the Learning Outcomes in the course. Computer labs with lectures give the students an opportunity to ask questions about assignments and receive guidance in the proper use of OnShape. Canvas (canvas.kth.se/courses/31351) is used to deliver the course and a supplementary Canvas Sandbox exists with additional LEGO Element detail drawings (canvas.kth.se/courses/139) for use in the project. There are three course blocks; CAD1 = four individual activities (i.e. quizzes and assignments) directly coupled with relevant topic module and Learning Outcomes in the course. PROA = the project task (two to three students in a group) is a simple machine built with LEGO, then designed and documented in OnShape. DEXA = an individual examination in the computer lab, with three to five different tasks that need to be completed in a four hour period.</p> <p><u>Swedish (Google translate)</u></p> <p>Hela kursen kördes via ZOOM. Denna kurs är en introduktion i användningen av ett datorbaserat verktyg i design och dokumentation av produktkoncept med hjälp av OnShape (KTH Enterprise Onshape, kth.onshape.com), en webbläsarbaserad CAD-applikation. Kursterminen är uppdelad i fem ämnesmoduler; 1) Läsa tekniska ritningar, 2) 3D-delmodellering, 3) Ritningsautomation, 4) 3D-monteringsmodellering och 5) Projekt. Varje ämnesmodul inleds med en föreläsning om modulens omfattning (2-3 timmar per vecka), som stöds av en specialistledd online-föreläsning (3 timmar/vecka) som presenterar den praktiska tillämpningen av OnShape.</p> | | |

| | | | |
|--|--|--|-----|
| | <p>Föreläsningar syftar till att förtydliga hur man utför uppdrag för att uppfylla lärandemålen i kursen. Datorlabb med föreläsningar ger studenterna möjlighet att ställa frågor om uppgifter och få vägledning i korrekt användning av OnShape.</p> <p>Canvas (canvas.kth.se/courses/31351) används för att leverera kursen och en kompletterande Canvas Sandbox finns med ytterligare LEGO Element detaljritningar (canvas.kth.se/courses/139) för användning i projektet.</p> <p>Det finns tre kursblock;</p> <p>CAD1 = fyra individuella aktiviteter direkt kopplade till relevant ämnesmodul och lärandemål i kursen.</p> <p>PROA = projektuppgiften är en enkel maskin demonstrerad med LEGO, design och dokumenterad i OnShape</p> <p>DEXA = en individuell undersökning i datalaboratoriet, med tre till fem olika uppgifter som måste avslutas under en fyra timmars period.</p> | | |
| Antal registrerade studenter | 122 | Antal förstagångsregistrerade studenter (ffg) (ej obligatoriskt) | 112 |
| Prestationsgrad efter första examinationstillfället* | 67% | Prestationsgrad efter första examinationstillfället för ffg (ej obligatoriskt) | |
| Examinationsgrad efter första examinationstillfället* | | Examinationsgrad efter första examinationstillfället för ffg (ej obligatoriskt) | |
| Svarsfrekvens vid kursvärdering | LEQ enkät på KTH Social; not enough responses for results to be compiled | | |
| Kursvärdering <ul style="list-style-type: none"> • Sammanfattning av kursvärdering • Sammanfattning av studenternas åsikter inklusive de öppna frågorna • Anser studenterna att dom arbetar i en omfattning som motsvarar kursens poäng? | <ul style="list-style-type: none"> • During VT2021, all lectures and labs were moved to ZOOM where participation was at about 30% of the registered students. • Students were interviewed after online-lectures to assess the scope of material on OnShape that was presented to the students. • Very low attendance in online lectures (about 40%). | | |
| Sammanfattning av kursmöte | --- | | |
| Analys <ul style="list-style-type: none"> • sammanfattande synpunkter från kursansvarig • kursens starka och svaga sidor utifrån kursvärderingen och kurslärarnas reflektioner, även i förhållande till de förändringar som gjorts inför kursomgången. • Reflektion om hur kopplingen mellan lärandemål, läraaktiviteter | The impact of the pandemic <ul style="list-style-type: none"> • The entire course was delivered using ZOOM. • Using ZOOM presented the course teachers with a difficulty in engaging weaker students or students that did not attend lectures. • Vast majority of the students did not turn on their video during lectures. The impact of OnShape <ul style="list-style-type: none"> • This was the first year that OnShape was used in this course. Previous courses used a CAD application (Creo Parametric) installed in KTH computer labs. Students then wanted to be able to install the same software in their own computers. Using OnShape, students did not need to install any software; however, they did need to be sure about which OnShape version they were logging into (i.e. the KTH version or the free version). No course assignments were allowed from the free version of OnShape. | | |

och examination med målrelaterade betygskriterier fungerar i kursen.

- Förslag på eventuella förändringar av kursen med motivering.
- Finns det betydande skillnader i upplevelse av kursen mellan:
Studenterna som identifierar sig som kvinnor och män?
Studenterna med eller utan uppgiven funktionsnedsättning?
- Vad i kursen kan utvecklas på kort och lång sikt?

- There is a free version of OnShape and then there is a version available to KTH students. It took students a small bit of effort to understand the difference, especially since course assignments were not accepted from the free version of OnShape.
- Students found OnShape an easy CAD application to learn to use.
- The consultant from PDS Vision that delivered the specialist lectures online was a very good resource.

About the Project (PROA)

- In previous versions of the course, KTH Södertälje provided students with LEGO kits that allowed them to physically explore the different simple machines that could be designed and documented according to the task instructions. Given the closure of KTH facilities, this resource needed to be provided by the students themselves; they had to find their own set of LEGO bricks. Several student teams did not bother to build a LEGO model.
- Project groups were created randomly using Canvas. The students had a clear problem reaching out to each other to start the project, using the information found in Canvas for the project assignments. Some students took several weeks to reply to contact requests. Other students did not reply to contact requests.
- Students got angry when the difference in ambition level manifested itself during the execution of the project. Then there were the students that cheated in their execution of the project by getting someone else to do their work.
- A lot of time was spent by the course teacher re-arranging the students into groups of active students, so that they could begin the project task.

About the Examination (DEXA)

- The final examination is always delivered as a digital exam in the KTH Södertälje computer labs. Every time this exam is presented there are always a small but significant number of students that demonstrate that they do not know how to use a KTH computer with Canvas and OnShape.
- Students also demonstrate a difficulty in reading and comprehending the instructions for executing the examination in Canvas / OnShape.

About the Assignments (CAD1)

- There are quizzes for the Reading Assignments from the course literature. Students can attempt to complete some tasks without completing the Reading Assignments, but that decision to avoid the quizzes pushes down their success level.
- Students complain that the Reading Assignments take too much time. And, they also complain that the description of the project task is not clear enough to understand.

About the Course

- Every year, even after eight years of delivering this course, I find that it triggers a very strong reaction from the students. The reaction is positive and/or negative.
- This course is also a decisive course for the students; those that do well continue with the IoD specialization and those that do not do well continue with the IEP specialization.
- The Learning Outcomes for this course are relevant to the basic TIMAS educational program, regardless of the specialization that can be chosen for continued studies.

| | |
|---------------|---|
| | <ul style="list-style-type: none"> • LEGO is a highly systematic and accessible means of designing conceptual systems of mechatronic products. • A scheduled Course Meeting needs to be incorporated in the course, where the Mentimeter (or similar) survey tool is used to record student opinions of the course. • The execution of this year's course was clearly hampered by the restrictions placed by KTH on the accessibility of the computer labs as a reaction to the pandemic. There are a significant number of students that do not have the resources (connection to the internet, access to computers and telephones) necessary to participate and complete this course as an online course. Closing the computer labs, literally shutout many students from participating in the course, which is in-fact a form of general discrimination by KTH. <p>ADJUSTMENTS TO BE IMPLEMENTED IN THE EXECUTION OF THE COURSE</p> <ul style="list-style-type: none"> • Move the compendium into Canvas, instead of being a separate downloadable pdf. Implement a quiz directly into the compendium. • The project should be executed according to the KTH Södertälje project template, which requires tollgate (i.e. BM / BP) submissions that clarify progress in the project. |
| Övrigt | Nothing in this section. |

*Med "prestationsgrad" avses antalet presterade högskolepoäng efter första examinationstillfället (för samtliga examinerande moment) för samtliga studenter dividerat med antalet möjliga högskolepoäng för alla registrerade studenter.

Med "examinationsgrad" avses antalet studenter som klarat alla moment i kursen efter första examinationstillfällena dividerat med antalet registrerade studenter.