



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Ytbaserad modellering, rendering och design

Surface-based Modelling, Rendering and Design

IDEN60, 7,5 credits, A (Second Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED ID

Date of Decision: 2023-03-16

General Information

Main field: Industrial Design.

Compulsory for: MD4

Language of instruction: The course will be given in English

Aim

3D surface modelling and rendering are relevant components of the contemporary industrial design process. Upon completion of the course, students shall have a deeper understanding of three-dimensional design and shall be confident to independently realise design concepts using 3D software, including exporting data and generating 3D images for design development and presentation purposes. The focus will be to extend the students' skillset within surface modelling as a complementary tool to solid modelling when designing complex forms and to provide them with knowledge of tools and analytics to create and modify surfaces with a high quality standard.

To fully grasp the utility value of surface modelling, the students will be taught conceptual tools to actively and critically reflect on the design aspects of 3D form in an industrial design context.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

Have the ability to understand and critically reflect on the design qualities and abstract relationships of 3D forms, including aspects such as:

- Surface continuity and transitions

- Curvature
- Dominant/subdominant/subordinate form
- Proportion

Have the ability to understand and practice the typical 3D surface modelling workflow:

- Software user interface, i.e. menus, windows, icons, hotkeys and folder structure
- The 3D workspace; history and the principles of NURBS geometry, i.e. points, curves and surfaces
- Theoretical understanding of G0, G1, G2 and G3 continuity

Competences and skills

For a passing grade the student must

- Capturing the design intent by constructing and manipulating 3D curves through points in 3D workspace
- Modelling of simple quality curves as prerequisite for simple quality surfaces
- Analyse curves and surfaces in terms of curvature and continuity
- Constructing and modifying surfaces to accurately describe objects through re-modelling one simple and one complex object
- Modifying surfaces to explore the abstract relationships between forms
- Rendering finished objects in a photorealistic manner through texturing and lighting; i.e. mapping of images and high dynamic range images
- Outputting basic data for use in other software and rapid prototyping equipment

Judgement and approach

For a passing grade the student must

- exhibit an ability to assess the quality of aesthetical aspects of designs
- exhibit an ability to assess and verify the quality of curves and surfaces

Contents

The course builds on the skills and knowledge gained in previous courses in aesthetics, sketch modelling and CAD. The course consists of group lectures, complemented by individual supervision.

Examination details

Grading scale: UG - (U,G) - (Fail, Pass)

Assessment: 80 % attendance required. The assessment is based on the documentation of the individual assignments.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Admission

Admission requirements:

- AFOA25 Aesthetics I
- IDEA95 Introduction to Workshop Training

- MMTF25 Computer Aided Design/Computer Aided Manufacturing

The number of participants is limited to: No

The course overlaps following course/s: MMKF25, IDEA85, IDEA90

Reading list

- Current software manuals, on- and offline help functions, 3rd party websites, online user-forums and discussion groups, indicated by the course responsible at the course start.

Contact and other information

Course coordinator: Andreas Hopf, andreas.hopf@design.lth.se

Course homepage: <http://www.ide.lth.se>

Further information: The course contains of lectures and individual computer supervision.