

# Image Reproduction and Image Quality

Programme course

6 credits

Bildreproduktion och bildkvalitet

TNM097

Valid from: 2017 Spring semester

**Determined by**

Board of Studies for Computer Science  
and Media Technology

**Date determined**

2017-01-25

## Main field of study

Media Technology and Engineering

## Course level

Second cycle

## Advancement level

A1X

## Course offered for

- Media Technology and Engineering, M Sc in Engineering

## Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

## Prerequisites

Courses in Graphic arts and Image processing and analysis. Basic programming knowledge in Matlab.

## Intended learning outcomes

After the course the student shall be gaining deep knowledge in image reproduction, with focus on both electronic and conventional media. An important subarea within image reproduction is image quality, including different criteria affecting the perceived image quality for different reproduction methods, and models that include the characteristics of human eye to objectively calculate quality measures. Furthermore, the student shall master the modern systems for color management, both by being able to use the existing software and tools and by implementing the most important models (mathematical and physical) for color reproduction. After the course the student shall be able to:

- Describe the technical conditions, including limitations and possibilities, for a number of different image reproduction methods, both conventional and electronic.
- Describe the differences and properties of different color systems, and identify the optimal choices for different applications.
- Create, use and evaluate ICC-profiles in modern systems for color management.
- Use professional instruments for color measurement, and describe the function and the differences between different types of instruments.
- Calibrate and characterize image reproduction devices in order to ensure repeatability and controllable color reproduction.
- Describe and implement mathematical and physical models for color prediction and color separation.
- Identify and describe the technical attributes in a reproduced image that foremost affect the perceived image quality.
- Evaluate image reproduction quality by applying objective quality models.
- Give an overview of the actual research status within image reproduction, for both electronic and conventional reproduction methods.

## Course content

- Image reproduction: Technical conditions, limitations and possibilities for different techniques. Review of the actual research status, including for example multi-channel displays, multi-channel print and spectral image reproduction.
- Image quality: Criteria that affect the perceived image quality for different reproduction methods. Models, based on the human vision, to calculate objective quality measures.
- Color management: Color measure, calibrating and characterizing different image reproduction devices. Create and use ICC-profiles for color management. Color systems. Mathematical and physical models for color prediction and color separation.

## Teaching and working methods

The course consists of lectures and laboratory work, followed by a bigger project assignment with oral and written presentation.

## Examination

MUN1	Voluntary oral examination for higher grade	0 credits	U, 3, 4, 5
PRA1	Project work	4.5 credits	U, 3, 4, 5
LAB1	Laboratory work	1.5 credits	U, G

For grade 5, beside a well-performed project assignment, an individual oral exam is also required.

## Grades

Four-grade scale, LiU, U, 3, 4, 5

## Department

Institutionen för teknik och naturvetenskap

## Director of Studies or equivalent

Camilla Forsell

## Examiner

Sasan Gooran

## Education components

Preliminary scheduled hours: 48 h

Recommended self-study hours: 112 h

## Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at [http://stydokument.liu.se/Regelsamling/Innehall/Utbildning\\_pa\\_grund-\\_och\\_avancerad\\_niva](http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva).