

COSI Spectral Imaging Devices

Course level: Master

Course code: 3312031

ECTS Credits: 5.00

Course instructor/s: Pertti Silfsten with the assistance of guest researchers

Education period (Dates): 3rd semester

Language of instruction: English

Expected prior-knowledge: Color Science

Aim:

After completing this course, the student should know how spectral imaging and non-imaging data is produced using different methods. The student will be able to use different measuring systems. Also the applicability of different systems for different kind of samples should be understood. The student will also be familiar with different calibration methods of relative and absolute measuring systems. Topics included are: Imaging and non-imaging spectral measurement systems: Spectrophotometer, Spectroradiometer, Bispectrometer, Imaging camera, LCTF, Digital camera and Spectrogoniometer.

Teaching methods:

Lectures, laboratory demonstrations, seminar.

Course outline:

Learn to select and use most suitable measurement system to measure spectral object of any kind.

Lab experiments:

Laboratory work including measurement of given samples using different measurement systems.

Examination:

Written exam 2 hours, ordinary re-sit examination.

Learning Outcomes¹:

- *Knowledge and Comprehension* of the fundamentals, principles, applications, limits, relationships, of all concepts and topics covered by this course;
- *Application, Analysis, Synthesis and Evaluation* skills of the main concepts and topics covered by this course;
- Ability to apply/implement concepts and principles introduced in the lectures and laboratory exercises on practical tasks and on industrial study cases;
- Ability to self-learn, to understand some problems and to suggest/find solutions to solve these problems.

Assessment methods and tasks:

Presentation in seminar and written report on the given subject
The grade is composed: Written exam 50%, Report/presentation 50%

Assessment criterion:

Written exam and Practical works

Excellent - outstanding performance	A
Very Good - above the average standard but with some errors	B
Good - generally sound work with a number of notable errors	C

¹ The meaning of *keywords* written in italic used to define Learning Outcomes are detailed in Annex.

Satisfactory - fair but with significant shortcomings	D
Sufficient - performance meets the minimum criteria	E
Fail - some more work required before the credit can be awarded	FX
Fail - considerable further work is required	F

Detail of criteria used to assess acquired skills :

- *Activities and questionnaires giving evidence of knowing (5%)*
- *Activities and questionnaires giving evidence of comprehension/understanding (5%)*
- *Activities and questionnaires giving evidence of analysis (5%)*
- *Activities and questionnaires giving evidence of synthesis (5%)*
- *Activities and questionnaires giving evidence of evaluation (5%)*

Excellent	A
Very Good - above the average standard	B
Good - generally sound well	C
Satisfactory - but with significant shortcomings	D
Sufficient - performance meets the minimum criteria	E
Fail - some more work required	FX
Fail - considerable further work is required	F

The evaluation of informal learning outcomes will be based on questionnaires and laboratory notebook (self evaluation, learning diary).

Literature and study materials:

- Reference book: Wyszeski&Stiles: Color Science
- Additional books: Manuals of different measuring systems

Contact details:

PhD Pertti Silfsten
 University of Eastern Finland
 E-mail: Pertti.Silfsten@uef.fi
 Office hours: 8:00- 16:00 (from Monday to Friday)