Course Specifications
Valid as from the academic year 2020-2021

Colour and its Applications in Textiles (E064760)
Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size

<table>
<thead>
<tr>
<th>Credits</th>
<th>Study time 180 h</th>
<th>Contact hrs</th>
<th>60.0 h</th>
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</thead>
</table>

Course offerings and teaching methods in academic year 2020-2021

A (semester 2)
- English
- Gent
- Lecture
- Practicum
- Excursion

B (semester 2)
- Dutch
- Excursion
- Practicum
- Guided self-study

Lecturers in academic year 2020-2021
De Clerck, Karen
TW11
Lecturer-in-charge

Offered in the following programmes in 2020-2021

<table>
<thead>
<tr>
<th>Programme</th>
<th>crdts</th>
<th>offering</th>
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<tbody>
<tr>
<td>Master of Science in Electromechanical Engineering (main subject Control Engineering and Automation)</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>Master of Science in Electromechanical Engineering (main subject Electrical Power Engineering)</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>Master of Science in Electromechanical Engineering (main subject Maritime Engineering)</td>
<td>6</td>
<td>A</td>
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<tr>
<td>Master of Science in Electromechanical Engineering (main subject Mechanical Construction)</td>
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<td>A</td>
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<tr>
<td>Master of Science in Electromechanical Engineering (main subject Mechanical Energy Engineering)</td>
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<td>A</td>
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<tr>
<td>Master of Science in Sustainable Materials Engineering</td>
<td>6</td>
<td>A</td>
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<tr>
<td>Master of Science in Materials Engineering</td>
<td>6</td>
<td>A</td>
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</tbody>
</table>

Teaching languages
- Dutch
- English

Keywords
- Colour, dyes, dyeing, printing

Position of the course
The aim is to make the students familiar with the main aspects of the way in which colour is perceived and how colour can be quantified. Further, theoretical, practical and technological aspects related to the application of colour are dealt with for different textile materials.

Contents
- Basic concepts of colour: Interaction of dyes with electromagnetic radiation
- Classification of dyes: Classification based on chemical structure, Classification based on application method
- Quantification of Colour: Fundamentals of perceived colour, Quantification
- Kinetics and thermodynamics of the dyeing process: Kinetics, Thermodynamics
- Application of the various dye classes for the respective textile materials: Direct dyes, Reactive dyes, Acid dyes, Disperse dyes, Other dye classes, Printing, melt dyeing
- Dyeing machinery: dyeing machinery for continuous and discontinuous processes

Initial competences

(Approved)
Final competences

1. **Concepts**: basic concepts of colour; chemical structure of dyes; colour spaces; kinetics and thermodynamics of dyeing, diffusion, dye adsorption, dye affinity, dye substantivity; reactive dyes; direct dyes; acid dyes; disperse dyes; vat dyes; cationic dyes; pigments; melt dyeing; printing; dyeing machinery.

2. **Insights**: understanding the basics of colour; relation between chromofores and colour; the methodology of the colour index; the function of the light source, the eye and the sample for the perceived colour; evolution in the quantification of colour; the kinetics of the different steps in a dyeing process; the thermodynamics of the different steps in a dyeing process; dyeing with direct dyes; dyeing with reactive dyes; dyeing with acid dyes; dyeing with disperse dyes; printing of textiles, advantages and disadvantages compared to dyeing; melt dyeing; the mechanisms and application of dyeing machinery.

3. **Skills**: measuring and interpreting a spectrum; measuring and interpreting colour; dyeing with direct dyes; dyeing with reactive dyes; dyeing with acid dyes; dyeing with disperse dyes; measuring and interpreting colour fastness.

**Conditions for credit contract**

Access to this course unit via a credit contract is determined after successful competences assessment.

**Conditions for exam contract**

This course unit cannot be taken via an exam contract.

**Teaching methods**

Guided self-study, excursion, lecture, practicum.

**Extra information on the teaching methods**

Classroom lectures; Lab sessions; Excursion.

**Learning materials and price**

Slides and supporting hand-outs.

**References**

- Color Chemistry, H. Zollinger, VCH (Weinheim), ISBN 3-527-28352-8
- The Theory of Coloration of Textiles, Ed. A. Johnson, Society of Dyers and Colourists (Bradford), ISBN 0 901956 48 1
- Chemical Principles of Synthetic Fibre Dyeing, S. M. Burkinshaw, Chapman & Hall (Glasgow), ISBN 0 7514 0043 2
- Basic Principles of Textile Coloration, A.D. Broadbent, Society of Dyers and Colourists (Bradford), ISBN 0 901956 76 7

**Course content-related study coaching**

**Evaluation methods**

End-of-term evaluation and continuous assessment.

**Examination methods in case of periodic evaluation during the first examination period**

Oral examination.

**Examination methods in case of periodic evaluation during the second examination period**

Oral examination.

**Examination methods in case of permanent evaluation**

Participation, job performance assessment, report.

**Possibilities of retake in case of permanent evaluation**

Examination during the second examination period is possible in modified form.

**Extra information on the examination methods**


Non-periodic evaluation: presence and work attitude during practical work, report.

**Calculation of the examination mark**

Periodic evaluation: 17/20
Non-periodic evaluation: 3/20

(Approved) 2