# Clean Technology

<table>
<thead>
<tr>
<th>Reference</th>
<th>IMMITE01000010</th>
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</thead>
</table>

### Taught in
- First Master of Bioscience Engineering: Chemistry and Bioprocess Technology
- First Master of Bioscience Engineering: Environmental Technology
- First Master of Bioscience Engineering: Environmental Technology
- Elective Course List for first Master of Bioscience Engineering: Food Science and Nutrition

### Elective Course List for first Master of Bioscience Engineering: Food Science and Nutrition

<table>
<thead>
<tr>
<th>Theory</th>
<th>(A)</th>
<th>30.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercises</td>
<td>(B)</td>
<td>30.0</td>
</tr>
<tr>
<td>Training and projects</td>
<td>(C)</td>
<td>0.0</td>
</tr>
<tr>
<td>Studytime</td>
<td>(D)</td>
<td>135.0</td>
</tr>
<tr>
<td>Studypoints</td>
<td>(E)</td>
<td>5</td>
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</table>

### Level

<table>
<thead>
<tr>
<th>Credit contract?</th>
<th>Access is determined after successful competences assessment</th>
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<tbody>
<tr>
<td>Examination contract?</td>
<td>This course can not be taken through this kind of contract</td>
</tr>
<tr>
<td>Credit contract mandatory if Exam contract?</td>
<td>Separate credit contract mandatory</td>
</tr>
<tr>
<td>Retake possible in case of permanent evaluation?</td>
<td>Yes, in altered form</td>
</tr>
</tbody>
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### Teaching Language
- English

### Lecturer
- Jo Dewulf

### Department
- LA11

### Co-lecturers

### Key Words

Clean technology, sustainable technology, industrial ecology, green chemistry, exergy
Position of the Course

This course focuses on making technological operations more sustainable. Attention is paid in how far choice of resources, process efficiency and avoidance of waste streams all contribute to clean technology. Here, concepts of sustainable technology, industrial ecology, green chemistry, life cycle assessment are discussed. Next, specific (semi)quantitative approaches such as life cycle analysis, design for environment, pinch analysis, input/output analysis and exergy analysis will be studied.

Contents

1. Technology & sustainability
2. Effects of technology on the environment
3. Changing technology through new concepts
   3.1. Clean technology
   3.2. Eco management and audit scheme
   3.3. Industrial ecology
4. Changing technology at the process design
   4.1. Green chemistry
   4.2. Pollution prevention at the unit operations
5. Changing technology through process Integration
6. Assessing technology through LCA en EF
7. Assessing technology through input/output analysis
8. Assessing technology through exergy analysis

Starting Competences

There are no specific requirements.

Final Competences

Understanding how resource consumption and selection, process efficiency and emission patterns affect the contribution of technology to environmental sustainability. Also the importance of technology within industrial society has to be understood.

Teaching and Learning Material

Cost: 6.0 EUR
A syllabus is available.

References

Course Content-Related Study Coaching

- 

Teaching Methods

Group work, Lecture, Seminar: coached exercises

Evaluation Moments

periodic and permanent evaluation

Calculation of the examination mark:
Periodic evaluation: 13
Permanent evaluation: 7
Students who eschew periodic and permanent evaluations for this course unit may be failed by the examiner.

Evaluation Methods

Examination methods in case of periodic evaluation during the first examination period: Open book examination
Examination methods in case of periodic evaluation during the second examination period: Open book examination
Examination methods in case of permanent evaluation during the first examination period: Oral examination