Reg. no: HNT 2024/11

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culty of Health, Science

and Technology

Chemical Engineering

# Course syllabus

**Bootcamp course in pulp and paper technology**

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| **Course code:**   | 7KTE004  |
| **Course title:**  | Bootcamp course in pulp and paper technology  |
|   | Intensivkurs imassa- och pappersteknik  |
| **Subject**:  | Chemical engineering  |
| **Credits:**  | 7.5 ECTS  |
| **Education cycle:**  | Doctoral level  |

## Syllabus approval

The syllabus was approved by the Faculty of Health, Science and Technology on 6 November 2024 and is effective from the autumn semester 2024 at Karlstad University.

**Language of instruction**

English or Swedish.

## Entry requirements and selection

Admission to the doctoral programme in Chemical Engineering. The course is aimed primarily at doctoral students at Karlstad University, and secondarily at doctoral students at other universities. Doctoral students from other subjects may be admitted following a special assessment.

## Learning outcomes

Upon completion of the course, the doctoral student should be able to:

* Give an account of the production of chemical and mechanical pulp.
* Identify and describe the different parts of a pulp mill.
* Identify and describe the elements of various types of paper and board machines.
* Perform calculations on components, process conditions, and product properties based on scientific connections.
* Justify selections of raw materials and manufacturing processes for paper and board production to achieve product-specific properties.

* Identify and explain the purpose of common analytical methods for pulp and paper, and implement these methods.
* Analyse how additives in paper and board production can be connected to product properties, runnability, energy use, and environmental impact.

**Course content**

Instruction is in the form of lectures and independent laboratory work.

## Reading list

The reading list primarily comprises scientific papers which the students will receive from the teachers.

## Examination

Assessment is based on mandatory laboratory components, an individual take-home examination and a written laboratory report.

**Grades**

One of the grades Pass (G) or Fail (U) is awarded in the examination of the course.

## Quality assurance

A written evaluation is performed after the end of the course. The result of the evaluation is collated and made available in accordance with The Higher Education Ordinance, Chap. 1, Sect. 14.

**Course certificate**

Course certificates are issued upon request.

## Goal matrix

The course contributes to partial fulfilment of the goals marked with an X below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | **Doctor**  |    |   |   | **Licentiate**  |    |
|   | **Knowledge and understanding**  |   |   |   | **Knowledge and understanding**  |   |
| 1a  | Broad knowledge and systematic understanding of the research field  |   |   | 1a  | demonstrate knowledge and understanding of the research field  |   |
| 1b  | Advanced and up-to-date specialised knowledge in a limited area of this field  |  X  |   | 1b  | Up-to-date specialised knowledge in a limited area of this field  |  X  |
| 1c  | Familiarity with research methodology in general and the methods of the specific field of research in particular  |  X  |   | 1c  | Specialised knowledge of research methodology in general and the methods of the specific field of research in particular  |  X  |
|   | **Competence and skills**  |   |   |   | **Competence and skills**  |   |
| 2a  | The capacity for scholarly analysis and synthesis, and  |   |   | 2a  | demonstrate the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively  |   |
| 2b  | to review and assess new and complex phenomena, issues and situations autonomously and critically  |   |   | 2b  | plan and use appropriate methods to undertake a limited piece of research and other qualified tasks within predetermined time frames in order to contribute to the formation of knowledge  |   |
| 3a  | demonstrate the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively,  |   |   | 2c  | as well as to evaluate this work,  |   |
| 3b  | plan and use appropriate methods to undertake research and other qualified tasks within predetermined time frames and to review and evaluate such work  |   |   | 3a  | demonstrate the ability in both national and international contexts to present and discuss research and research findings in speech and writing and in dialogue with the academic community and  |   |
| 4  | demonstrate through a dissertation the ability to make a significant contribution to the formation of knowledge through his or her own research  |   |   | 3b  | society in general  |   |
| 5a  | demonstrate the ability in both national and international contexts to present and discuss research and research findings authoritatively in speech and writing and in dialogue with the academic community and  |   |   | 4  | demonstrate the skills required to participate autonomously in research and development work and to work autonomously in some other qualified capacity.  |   |
| 5b  | society in general  |   |   |   |   |   |
| 6  | demonstrate the ability to identify the need for further knowledge and  |   |   |    |    |    |
| 7  | demonstrate the capacity to contribute to social development and support the learning of others both through research and education and in some other qualified professional capacity  |   |   |
|   | **Judgement and approach**  |   |   |   | **Judgement and approach**  |   |
| 8a  | Demonstrate intellectual autonomy and disciplinary rectitude as well as  |   |   | 5  | demonstrate the ability to make assessments of ethical aspects of his or her own research  |   |
| 8b  | the ability to make assessments of research ethics, and  |   |   | 6  | demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used  |   |
| 9  | demonstrate specialised insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used.  |   |   | 7  | demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.  |   |