

CURRICULUM
for
**AP Graduate in Chemical and Biotechnical Science,
(Laborant AK)**

Revised 20.06.2018



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This national part of the curriculum for the Academy Profession Degree Chemical and Biotechnical Science (AP) has been released in accordance with §18, section 1 in the Ministerial Order for technical and commercial Academy Profession Programmes and Professional Bachelor Programmes. This curriculum is supplemented with an institutional part of the curriculum, which is provided by the individual institution that offers the programme.

After it has been approved by either the Board of Directors (or the Rectors) and after consultation with the institutions' Educational Committee and the External Examiners chairmanship for the specific programme, the educational network for the Academy Profession Degree in Chemical and Biotechnical Science (AP) will prepare the institutional part.

1. The programme's goals for learning outcomes

Knowledge and understanding

The graduate

- has knowledge of laboratory technician industry practices concerning the use of laboratory equipment, analytical techniques as well as centrally applied scientific theory in relation to the laboratory field
- has an understanding of the practice and centrally applied theory and methodology which focuses on the principles of analysis technique methods as well as occupational safety and quality assurance in relation to laboratory work

Skills

The graduate

- can use and combine the laboratory technician's key analysis technique methods and theories. This includes being able to use laboratory calculations, quality assurance of equipment, methods and laboratory work, as well as rules for the working environment, English language specifications and manuals as well as IT in connection with laboratory work and data processing
- can evaluate laboratory observations and results as well as real-life technical laboratory problems and can outline and choose solutions
- can convey laboratory observations and results, technical laboratory problems as well as solutions to business partners

Competencies

The graduate

- can enter into and manage optimisation and development situations in the laboratory
- can, using a professional approach, take part in academic and interdisciplinary collaboration
- can, in a structured context, acquire new knowledge, skills and competencies in relation to the laboratory field

2. The programme includes 7 national subject elements

2.1. Laboratory technique and understanding

Content

The subject element deals with the basics of laboratory work and the basic laboratory equipment, including good behaviour in a laboratory and academic cooperation in order to be able to perform the most simple laboratory tasks.

Learning objectives for laboratory technique and understanding

Knowledge

The student will gain knowledge about:

- basic laboratory work and laboratory equipment as well as theory in relation to laboratory work
- good behaviour in the laboratory

Skills

The student will get the skills to:

- use basic laboratory equipment as well as the related calculations and theory in relation to laboratory work
- manage and evaluate simple laboratory observations and results

Competencies

The student will learn to:

- manage laboratory technique and understanding
- participate in the cooperation and practice good behaviour in a laboratory

ECTS weight

The subject element laboratory technique and understanding is weighted 5 ECTS.

2.2. Analysis technique

Content

The national subject element deals with principles and the use of key analysis technique methods for detection, identification and quantification. This includes planning, calculations, sample

preparation, regulations, manuals, analysis equipment and techniques as well as the processing, evaluation and dissemination of data in order to be able to conduct key analyses.

Learning objectives of analysis technique

Knowledge

The student will gain knowledge about:

- central analysis equipment and scientific theory in relation to laboratory work
- sample preparation for key analysis techniques
- and an understanding of the key principles of the methods of analysis technique

Skills

The student will get the skills to:

- use the key types of analysis equipment, analysis techniques and related calculations and scientific theory in relation to laboratory work
- use English language regulations and manuals
- use IT in connection with the key analytical work and data processing
- evaluate laboratory observations and results
- convey laboratory observations and results to business partners

Competencies

The student will learn to:

- manage the planning and execution of key and routine analysis tasks
- in a structured context, acquire new knowledge, skills and competencies in relation to key analysis techniques

ECTS weight

The national subject element analysis technique is weighted 30 ECTS.

2.3. Advanced analysis technique

Content

The national subject element deals with principles and the use of the more complex analysis technique methods for detection, identification and quantification. You can for example, focus on long-term projects, large amounts of data, composite and/or advanced techniques.



Learning objectives for advanced analysis technique

Knowledge

The student will gain knowledge about:

- the more complex analysis technique methods

Skills

The student will get the skills to:

- evaluate complex laboratory observations and results

Competencies

The student will learn to:

- manage the planning and execution of complex analysis tasks
- in a structured context, acquire new knowledge, skills and competencies in relation to the analysis technique methods

ECTS weight

The national subject element advanced analysis technique is weighted 5 ECTS.

2.4. Working environment

Content

The subject element is concerned with general safety and hygiene rules in the laboratory, including ergonomics, the use of safety equipment and personal protective equipment, as well as the handling of accidents in the laboratory. It also includes classification, labelling and handling of chemical and biological agents, including workplace safety instructions, risk assessment and waste management, which form the basis for the safety, health and environmentally safe conduction of laboratory work.

Learning objectives for working environment

Knowledge:

The student will gain knowledge about:

- and an understanding of general safety and hygiene rules in the laboratory
- the principles of classification, labelling and handling of chemical and biological agents

Skills:

The student will get the skills to:

- use safety equipment and personal protective equipment
- apply applicable rules for the classification and labelling of chemical and biological agents
- apply rules for waste management

Competencies:

The student will learn to:

- manage laboratory work in a safety, health and environmentally responsible manner
- in a structured context, acquire new knowledge, skills and competencies in relation to working environment

ECTS weight

The national subject element working environment is weighted 5 ECTS.

2.5. Quality assurance

Content

The subject element deals with an introduction to quality systems. Quality assurance also includes laboratory data and results, including documentation and assessment on the basis of statistical studies and other quality assurance tools, in order to ensure reliable results.

Learning objectives for quality assurance

Knowledge

The student will gain knowledge about:

- and an understanding of quality assurance in laboratory work

Skills

The student will get the skills to:

- apply methods and tools to document laboratory work
- assess laboratory work based on statistical calculations and/or the use of controls

Competencies:

The student will learn to:

- manage laboratory work qualitatively correct manner

ECTS weight

The subject element quality assurance is weighted 5 ECTS credits.

2.6. Qualification and validation

Content

The subject element deals with the qualification of equipment and the validation of analytical methods. The focus is on selected parameters as well as planning, implementation, data processing and reporting in order to ensure reliable analysis results.

Learning objectives for qualification and validation

Knowledge

The student will gain knowledge about:

- the qualification of laboratory equipment
- the validation of methods of analysis
- and an understanding of relevant statistical methods used in relation with qualification and validation

Skills

The student will get the skills to:

- use and evaluate the relevant statistical tests and/or checks in relation to qualification and validation

Competencies:

The student will learn to:

- deals with the routine qualification of equipment and the validation of analytical methods.

ECTS weight

The subject element qualification and validation is weighted 5 ECTS credits.

2.7. Project work

Content

The subject element deals with project work in relation to a laboratory task. The focus is on selected elements such as planning, implementation, documentation, evaluation and communication in order to be able to participate in project work in the laboratory

Learning objectives for project work

Knowledge

The student will gain knowledge about:

- the processes in project work

Skills

The student will get the skills to:

- apply and evaluate methods and tools to plan, perform and document project work
- communicate solutions from project work to business partners

Competencies

The student will learn to:

- using a professional approach, take part in project collaboration

ECTS weight

The subject element project work is weighted 5 ECTS credits.

2.8. The number of exams in the national subject elements

National subject elements for the 1st year of study constitute 50 ECTS (at least 45 ECTS credits out of the programme's national subject elements total), of which at least 45 ECTS credits are included in the exam/s, which make up the first-year exam.

In addition, there is 1 exam in the other national subject elements, as well as one further exam in form of the final exam project. For the number of exams in the internship, please refer to section 3.

For a comprehensive overview of all the programme's exams, please refer to the institutional part of the curriculum, as the national subject elements described in this curriculum can be examined together with the subject elements specified in the institutional part of the curriculum.

3. Internship

Learning objectives for programme's internship

Knowledge

The student will gain knowledge about:

- the company's core elements and organisation
- the laboratory's workflow, including the planning and allocation of tasks, communication and decision-making processes
- the company's safety organisation
- the laboratory's workplace risk assessment, workplace safety instructions and waste management
- the laboratory's quality assurance, including procedures that ensure reliable results and documentation
- and an understanding of applied analysis technique methods

Skills

The student will get the skills to:

- use the laboratory's existing rules for the working environment, including the use of safety equipment and personal protective equipment
- use the laboratory's existing quality assurance procedures for documentation of own work and quality assurance of analytical results, methods and equipment
- use a broad range of the laboratory's analysis technique methods as well as evaluate and communicate laboratory observations and results to business partners

Competencies

The student will learn to:

- participate in academic and interdisciplinary collaboration
- manage routine laboratory tasks as well as optimisation and developmental situations in the laboratory
- in a structured context, acquire new knowledge, skills and competencies in relation to the laboratory field

ECTS weight

The internship is weighted 50 ECTS credits.

Number of exams

The internship is completed with 1 exam.



4. Requirements for the main exam project.

The learning objectives for the main exam project are identical to the programme's learning objectives listed above under point 1.

The main exam project must demonstrate the student's understanding of practices and centrally applied theory and methods in relation to a real-life problem, which is based upon a specific task within the programme's area. The problem statement that must be central to the programme and profession, is formulated by the student, possibly in collaboration with a private or public company. The Academy approves the problem statement.

The project must last the equivalent of approximately 7 weeks of full-time work where the student works with a thesis statement, information search, practical laboratory work, result processing, report writing and an oral examination.

The student must work independently with the project, and the project report must include findings from the student's own work.

If others have contributed with findings, this must be clearly stated in the report.

Exams for the main exam project

The main exam project completes the programme in the last semester once all the preceding exams have been passed.

ECTS weight

The main exam project is weighted 10 ECTS credits.

Examination form

The exam consists of a project and an oral part with an external co-examiner, a combined mark is given based on the 7-point scale for the written project and the oral presentation.

5. Rules on credit

Passed programme elements are equivalent to similar programme elements taken at other educational institutions offering this programme.

The students are obliged to inform us of any completed educational elements from another Danish or foreign higher education programme or any jobs which are likely to provide credit.

The Academy approves, in each instance, credit on the basis of completed programme elements and any jobs which meet the objectives of the subjects, the educational part and the internship parts.

The decision is taken according to an academic assessment.

For prior credit approval of studies in Denmark or abroad, students are required to document each approved and completed programme element on the completion of these studies.

In connection with applying for prior credit approval, the students give permission that the institution can obtain the necessary information after the student's completion.

On approval according to the above, the programme element is deemed to be passed if it was passed according to the rules of the programme in question.

6. Commencement

Commencement

All enrolled students will be transferred to this curriculum on 1.08.2018

Simultaneously, the previous national curriculum from August 2014 is NOT valid.