



The Scandinavian School of Brewing



Course Programme 2009 - 2012

Diploma Master Brewer Courses	2009	2010	2011	2012
<u>M1</u> : Raw materials & Wort Production	17 Aug -25 Sep	16 Aug -24 Sep	15 Aug -23 Sep	13 Aug -21 Sep
<u>M2</u> : Fermentation	05 Oct -13 Nov	04 Oct -12 Nov	03 Oct -11 Nov	01 Oct -09 Nov
<u>M3</u> : Packaging & Soft drinks	12 Jan -13 Feb	11 Jan -12 Feb	10 Jan -11 Feb	09 Jan -10 Feb
<u>M4</u> : Utilities	23 Feb -17 Mar	22 Feb - 16 Mar	21 Feb -15 Mar	20 Feb -13 Mar
Course for commercial managers	2009	2010	2011	2012
Brewing Course	25 - 29 May	19 - 23 April	09 - 13 May	16 - 20 April
Certificate in Brewing & Packaging	2009	2010	2011	2012
<u>M1</u> :	27 Apr - 1 May	03 - 07 May	11 - 15 Apr	07 - 11 May
<u>M2</u> :	28 Sep - 2 Oct	27 Sep - 1 Oct	26 - 30 Sep	24 - 28 Sep
<u>M3</u> :	26 - 27 Nov	25 - 26 Nov	24 - 25 Nov	21 - 23 Nov
Diplombrygger				
<u>M1</u> :	24 - 28 Aug	23 - 27 Aug	22 - 26 Aug	20 - 24 Aug
<u>M2</u> :	16 - 20 Nov	15 - 19 Nov	14 - 18 Nov	12 - 16 Nov
<u>M3</u> :		4 - 5 Feb	3 - 4 Feb	2 - 3 Feb



Introduction

The Scandinavian School of Brewing – Copenhagen: History and ownership

The Scandinavian School of Brewing (SSB) was founded in 1925 by the Danish Brewers' Association, the Norwegian Brewers' Association and the Swedish Brewers' Association jointly. In 1993 the Finnish Brewers' Association became a co-owner.

The school is a private and independent institution located in Copenhagen close to the Carlsberg Brewery. It is today owned by the four Nordic Brewers' Associations, which run it without state subsidies. Unlike other brewing schools in Europe the SSB is independent upon any university or technical institution.

The Board of the Scandinavian School of Brewing consists of members from Denmark, Norway, Sweden and Finland. The board members are appointed by the respective Brewers' Associations and thus reflect the ownership. In addition, an Advisory Board of senior managers from the brewing industry advises the SSB and the board with respect to ensuring, that quality of education, lecturers and courses offered rises to the highest possible level

The Brewing School has a permanent academic staff (a director and a training manager), and the real strength of the school is its fortune to be able to draw on a further staff of more than 60 external lecturers who combine a theoretical knowledge of brewing science with the practical experience of a Master Brewer. The teachers come from the Carlsberg Group, Alectia Brew, Royal Unibrew, other breweries, companies and institutions throughout Scandinavia and the United Kingdom and the rest of Europe.

The original and main purpose of the school was to set up and implement the syllabus which leads to the Diploma for Master Brewers. Over the years, however, a number of additional and related activities have been undertaken. These include a one week Brewing course, Diploma Brewer (diplombrygger) and Professional Updates, which change themes according to demand. From 2009 SSB offers a new course: Certificate in Brewing & Packaging. In addition, the school also teaches tailor-made courses for individual breweries, soft drinks plants and malting plants.

International: Origin of students

Today the Scandinavian School of Brewing operates internationally, as it accepts qualified students from outside the Nordic countries.

664 Master Brewers have since 1925 obtained their Diploma from the Scandinavian School of Brewing. Beyond the Nordic countries, the students came from Canada, China, Estonia, Hungary, Iceland, Israel, Italy, Kazakhstan, Latvia, Lebanon, Lithuania, Malawi, Malaysia, Nepal, Paraguay, Russia, Spain, Sri Lanka, Thailand, Turkey, Ukraine, United Kingdom and Vietnam.



Diploma Master Brewer Course

The Diploma Master Brewer Course 20½ weeks:

1. Raw materials & Wort Production	6 weeks
2. Fermentation	6 weeks
3. Packaging & Soft Drinks	5 weeks
4. Utilities	3½ weeks

Dates: Ref Course calendar on front page.

The Diploma Master Brewer Course is a post-graduate study. The curriculum focuses on practical malting - and brewing science, technology, packaging and soft drinks.

The entry qualifications are:

- A university degree, a B.Sc. in chemical engineering, food science, pharmacy or the equivalent
- At least nine month of documented extensive brewing experience, before graduating
- A good command of English

Each module is self-contained, thus an additional number of students can attend the individual modules as a separate course, provided a total number of 20 participants is not exceeded.

The teaching load is about 30 lectures per week, including laboratory work and technical visits.

The composition of each module is 50% Technology and the rest is divided between Brewing Chemistry, Brewing Analyses, Microbiology & Microbiological Control, and other topics. Each module is concluded with a written examination.

A four member censor committee (one member appointed by each of the Nordic Brewers' Associations) ensures that the successful candidates' knowledge is of high standard and relevant to the brewing industry.

Flexibility

It is recommended to attend the modules from M1 to M4 in that order. However, it is possible for candidates who are already working in the brewing industry to follow the modules in any order of the education scheme. This flexibility of the modular system has encouraged several companies to consider this opportunity. SSB requires the four modules completed within duration of no more than five years.

Practical experience - requirements

The practical experience must to the extent possible prepare the student for the lectures taught at SSB. Read information in details on www.brewingschool.dk.

Participation in individual modules:

As each module is self-contained, it is possible for candidates who already have working experience in the brewing industry to follow only the modules specific within their area of interest. In this case it is possible to exempt from the requirement of a university degree. A certificate is issued after each module.

Language:

The teaching is conducted in English.

Application:

Please use the Registration Form available at www.brewingschool.dk or e-mail directly.

Application forms can also be sent by request.

When to apply:

The number of participants are limited and as they are enrolled on "first-in" basis, it should be as soon as possible and not later than six weeks before beginning of module in question.

Course fee :

The fee is DKK 14,400.-/week per participant. For companies world-wide who are affiliated Nordic Member Breweries the course fee is DKK 12,300.-/ week. For Member Breweries the course fee is DKK 10,200.-/ week.

Payment:

Minimum 14 days before course start.

Accommodation:

Accommodation is for the account of the participating person (Brewery/Company).

A number of possibilities exist:

- Carlsberg Stable Guest Rooms. 12 guestrooms are available, and can be rented at a low price.
- Other accommodation in Copenhagen/Valby area, including breakfast, no special luxury but adequate for studying.
- First class hotel accommodation can also be arranged.

The Scandinavian School of Brewing will assist in booking the hotels. Administration fee is DKK 150.- per week of booking.

For further information:

Contact to: The Scandinavian School of Brewing, Gamle Carlsberg Vej 16, DK-2500 Valby, Denmark.
Phone: +45 33 27 24 00, Fax +45 33 27 24 01.
E-mail: ssb@brewingschool.dk



Diploma Master Brewer Course

Module 1: Raw Materials and wort production

This module (6 weeks) covers the raw materials used in brewing and the malting process. It includes the following subjects:

Barley and Barley Breeding and Genetics
Malt and Special Malts
Malting technology
Adjuncts – Sugar, Syrup, Maize, Grits, Rice etc.
Hop and Hop products
Brewing Water – Composition, Supply, Treatment
Brewing Chemistry in theory and practice
Microbiology
Raw materials and wort analyses in theory and practice
Audits
Malt purchase
Visit to Malting Plant
Brewhouse technology
Dry and wet milling of malt incl. Hammermills
Mashing in theory and practice
Mashing Methods
Brewing with or without adjuncts and/or enzymes
Wort Separation – Mash Filters and Lautertuns
Wort boiling, clarification and cooling
Cleaning and optimising Brewhouse
Brewhouse operations and Brewhouse process calculations
Brewing Chemistry in theory and practice
Energy savings and Brewhouse yield
Pilot Brewing from raw materials to start of fermentation
Basic brewery statistics, theory and use of software tools

Module 2: Fermentation

This module (6 weeks) covers beer processing from primary fermentation to bright beer stage. It includes the following subjects:

Wort handling
Yeast, yeast taxonomy and yeast breeding
Yeast propagation
Fermentation and maturation of malt worts and ciders
Yeast Handling
Recovered beer treatment
Beer stabilisation
Filtration in theory and practice
Types of filters
Design of a filter line
Design of Bright Beer Tanks
Future filtration systems
Plate pasteurisation
Biological Control
Microorganisms in the Brewery
Microbiology and Laboratory Exercises
Brewing Analyses in theory and practice
Brewing Chemistry in theory and practice
Low Alcohol and Non Alcohol Beer
Tank Construction
Flavor evaluation in theory and practical taste testing of beer
Cleaning and disinfection
Statistical Process Control (SPC)
Brewery Dimensioning

Module 3: Packaging & Soft Drinks

This module (5 weeks) covers bottling, canning, keggling, beer drive and dispatch of beer in bulk. The individual steps in a plant from depalletizer and its proper inspection and maintenance to finished products are covered. It includes the following subjects:

Packaging technology
Trends in packaging
Conveyors, Speed Control and Accumulation
Planning and design of packaging lines
Inspection systems in bottling lines
Machine Capacity and Line Efficiency
Filling technology
Labeling technology
Bottle washers
Pasteurisation theory and machinery
Packaging materials
Canning
Brewing and packaging chemistry and analyses
Quality Management
Warehousing
Beer Drive
Keg plants
Draught Beer dispensing
Biological Control
Flavor evaluation in theory and practice
Noise abatement
Production planning
Warehouse management
Supply Chain Management and KPI's
Continuous Improvement (CI) concepts and tools

A flavor house part with:

- Raw Materials
- Design of Soft Drinks
- Preparation of Soft Drinks

A syrup room part with:

- Equipment
- Carbon Dioxide
- Production

It also includes:

- Calculations
- Post mix and pre mix systems
- Soft drinks, RTD and cider analyses
- Microbiology and quality assurance
- Quality control

Module 4: Utilities

This module (3½ weeks) covers the energy supply plants and systems, energy consumption and emissions, maintenance, basic economics and standard accounts of consumption and production costs. Further, it gives an understanding of how the different sections of the brewery are connected and depend on each other. This is illustrated by calculating a "Standard Brewery".

It includes the following subjects:

Standard Brewery Basic calculations - projecting & designing a brewery

- Utilities
- Heating
- Cooling
- CO₂ recovery
- Electricity supply & treatment
- Compressed air
- Building installations

Hydraulics/ Pumps/ Valves/ Pipes

Process control

Environmental Management and reporting
Environmental Impact and Waste Water Treatment
Resources Management and Recovery

Maintenance

Business Economics

Standard Brewery Basic calculations - projecting & designing a brewery

- Investments evaluations
- Financial control
- Feasibility study introducing new products



Brewing Course

Duration:

5 days

Time:

Dates: Ref Course calendar on front page.

Participant Profile:

Technical, Administrative, Commercial, Management & staff from the brewing industry or related supplier/service organisations.

Objectives:

In order to provide technical knowledge used in the brewing industry. Furthermore, it is the purpose to focus on the technical problems involved when producing brands of uniform and high quality beer.

Content:

Finished Beer. Raw materials: Malt, adjunct and hops. Theoretical lectures covering the different production sections followed up with technical visits. The foundation of the processes: Brewing chemistry and microbiology, capacity calculations, quality assurance and taste testing.

Finally, Beer styles and Supply Chain management has

been added to bring the participants up to speed.

Language:

The teaching is conducted in English.

Application:

Please use the registration form available at www.brewingschool.dk "Course Registration" or e-mail directly.

Course fee:

The course fee is DKK 14,600.-/week per participant.

For Member breweries or companies who are affiliated Nordic Member Breweries the course fee is DKK 12,300.-/week per participant.

Payment:

Minimum 14 days before course start.

Accommodation:

Accommodation is for the account of the participating person (Brewery/Company).

The Scandinavian School of Brewing will assist in booking the hotels. Administration fee is DKK 150.-

For further information

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E-mail: gsb@brewingschool.dk



Brewing Demonstration in Classroom



The Scandinavian School of Brewing



Certificate in Brewing & Packaging

Duration:

Three modules – 12 days:
Two modules followed by an exam.
In between the modules the students prepare projects, defined during the Modules 1 & 2.

Time:

Dates: Ref course calendar on front page.

Participant Profile:

Minimum two months practical work in a brewery or a soft drink plant
Sufficient command in English, to understand and read English
Willingness to learn and obtain new knowledge
Expectation to complete a plant project and exam
E.g.: Line supervisors, planners from Supply Chain, craftsmen, skilled operators etc.

Objectives:

To provide technical knowledge used in the brewing and soft drink industry. Furthermore, it is the purpose to focus on the technical problems involved when producing brands/products of uniform and high quality.

Module 1:

Introduction and five days intensive teaching.
Syllabus covers raw materials to fermentation, plant visits and definition of student projects

Module 2:

Stabilisation, filtration, packaging, maintenance and plant visits for trouble shooting learnings and development of student projects.

Module 3:

Tank design, supply chain management, soft drinks, project presentation and exam and graduation dinner



Students testing beer styles

Content:

- Raw materials:
Malt, adjunct, hops and water treatment.
- Brewhouse process
- Brewers yeast
- Fermentation, stabilisation & filtration
- Finished beer
- Packaging & warehouse
- Brewery calculations
- Hygiene, cleaning, food legislation
- Taste testing
- Troubleshooting
- Maintenance concepts
- Continuous improvement concepts (e.g. LEAN)

Theoretical lectures covering the different production sections followed up with technical visits and exercises.

Language:

The teaching is conducted in English.

Application:

Please use the registration form available at www.brewingschool.dk "Course Registration" or e-mail directly.

Course fee:

The course fee is DKK 40,000.-/week per participant.
For Member breweries or companies who are affiliated Nordic Member Breweries the course fee is DKK 32,000.-/week per participant.

Payment:

Minimum 14 days before course start.

Accommodation:

Accommodation is for the account of the participating person (Brewery/Company).
The Scandinavian School of Brewing will assist in booking the hotels. Administration fee is DKK 150.-

For further information

Contact to: The Scandinavian School of Brewing,
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Diploma Brewer in Danish language: Diplom Brygger

Duration:

Three modules – 12 days:
Two modules followed by an exam.
In between the modules the students prepare projects, defined during the Modules 1 & 2.

Time:

Dates: Ref course calendar on front page.

Participant Profile:

Staff having minimum two months of practical brewing experience e.g. from a Micro Brewery

Objectives:

- Hygiene & Microbiology
- Raw Materials
- Wort Production
- Fermentation & Storage
- Stabilisation & Filtration Yeast Handling
- Calculation
- Product innovation
- Cleaning procedures
- Quality Assurance
- Taste Testing
- Beer Types
- Legislation & Self Control
- Bottling & Kegging

Theoretical lectures covering the different production sections followed up with technical visits and exercises.



Microbiological analyses

Language:

The teaching is conducted in Danish, only.

Application:

Please use the registration form available at www.brewingschool.dk "Course Registration" or e-mail directly.

Course fee:

The course fee is DKK 3,000.-/day per participant.
Price reduction: If number of participant exceeds 20.
For Nordic Member Breweries the course fee is DKK 2,500.-/day per participant.

Payment:

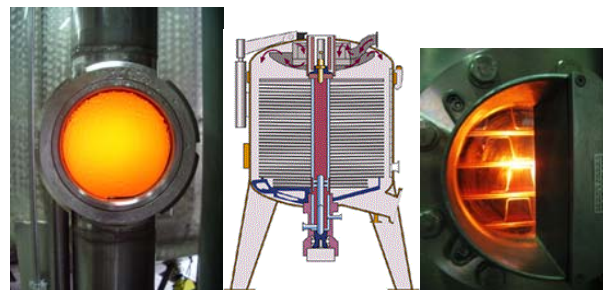
Minimum 14 days before course start.

Accommodation:

Accommodation is for the account of the participating person (Brewery/Company).
The Scandinavian School of Brewing will assist in booking the hotels. Administration fee is DKK 150.-

For further information

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Unfiltered Beer

Filter

Filtered Beer



SSB catalogue of services possible for training at your Brewery.

SSB realises that training in your local plant is cheaper than sending many people to Denmark, and in addition, we can tailor – make the programme to fit your specific needs.

There are several ways of doing this – we suggest, that you select 1 – 3 topics, which are currently of importance to you, and with which SSB has got direct experience and therefore can offer assistance in.

Examples of such topics:

- How to reduce extract losses from raw materials to warehouse
- How to use a KPI system to work towards improving performances
- Best practices in brewing, process, packaging, utilities, QA
- Tuning of brewing-, fermentation- and filtration processes
- Quality Assurance systems, laboratory design and instrumentation
- Trouble shooting in the plant to get quality, process and cost on track
- Dimensioning a brewery: Capacity of brewing vessels, packaging lines, etc.
- Increase your packaging line efficiencies
- Maintenance concepts – and economic spare parts management
- Energy Management – is heat, cold, compressed air and CO₂ used with care?
- Audits: Quality, Productivity, HACCP, LEAN: A SSB audit will in 1 or 2 days reveal deviations from your agreed standards at minimum brewery efforts and risk.
- Innovation Course for technical as well as for marketing managers
- Team building: The supervisor role, building competencies, the modern operator



Examining conveyor speeds



Way forward.

Scope:

Problem identification: Which problems in your brewery do you wish addressed?
Define, how much time you wish to dedicate for the teaching: Anything from one full day to one week is possible. Working hours during the week according to your wish.

When:

Time in the year: Consider the time during the year, where it is possible to bring your people together in one place.

Who:

Select the number of people, you wish to train. As a guide, 10 – 18 participants form a good number to train.

Where:

We recommend that the training is set up directly in or very near your plant. This enables us to arrange team exercises and on-the-job training to enhance the effect of the training.

For further information

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Calculating filler speeds