

SCANDINAVIAN SCHOOL OF BREWING — WE MAKE BREWERS BETTER

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For over 90 years, the Scandinavian School of Brewing (SSB) has been the source of brewing educations for the Nordic countries. SSB is owned by the four Nordic Brewers' Associations from Denmark, Norway, Sweden and Finland with the majority owned by the Danish Brewers' Association (DBA). SSB also shares offices with DBA in Faxehus – the former home of the director of Carlsberg.



Faxehus housing the Scandinavian School of Brewing

MASTER BREWER AT UNIVERSITY OF COPENHAGEN

Since 2011, the Master Brewer education has formed part of the master specialisation in Brewing Science and Technology at the University of Copenhagen, Department of Food Science (FOOD). The education is open for students from the university as well as from the industry with a qualifying bachelor degree in food science, chemical engineering,

biotechnology, pharmacy or similar. SSB is course-responsible for the courses Brewing Project in Practice, Brewing 1 and Brewing 2. Before they begin the theoretical courses, Brewing 1 and Brewing 2, the students should get a feeling of practical brewing in an internship in the course Brewing Project in Practice. The internship course consists of two parts, in which the students acquire practical experience in a small brewery and in a large brewery.



The two brewing courses are each divided into three modules: Brewing 1 into raw materials, brewhouse and fermentation and Brewing 2 into beer processing, packaging and utilities. The students from the university take the two complete brewing courses, but students from the industry can take the modules separately over up to a five-year period. All students take the same exams after each of the modules. Furthermore, the students from the university make an individual report regarding a group project. In past years, the project has been built around students designing their own brewery.

Lecturers are from the university as well as from industry. Each of them are specialists within their field. This ensures a balanced mix between the newest research and practical brewing experience. The main lecturers are listed on the SSB homepage. The lecturer roster is updated on a yearly basis, but many have been teaching for numerous years. Focus has lately been on pedagogical methods such as intended learning outcome and involvement of the students in exercises, cases

and group discussions. During both of the courses, we visit breweries and raw material producers.

The students develop a beer recipe during the course. They brew this beer on a pilot plant at the university. In 2019, the Dept. of Food Science purchased a state-of-the-art pilot brewhouse from Kaspar Schulz.

When students have passed the theoretical modules, SSB gives them the title of Diploma Brewery Engineer. In order to get the Diploma Master Brewer title, they need to have 9 months of practical experience within these six areas: malting, brewhouse, fermentation (incl. filtration), packaging, soft drinks and utilities.

At the university, SSB is also responsible for the Brewing Summer Course. This course is for students studying food science, engineering, biotechnology or similar having completed their second-year bachelor. In recent years, 20-30 students have passed the course every year.



MODULE	CONTENT
RAW MATERIALS	BARLEY BIOLOGY AND BIOCHEMISTRY, BARLEY BREEDING AND ANALYSES, MALTING TECHNOLOGY AND BIOCHEMISTRY, MALT ANALYSES, SPECIAL MALTS, MALTING CALCULATIONS, WATER REQUIREMENTS AND TREATMENT, ADJUNCTS IN BREWING, HOPS BIOLOGY AND CHEMISTRY, HOPS PROCESSING AND ANALYSES, HOPPING TECHNIQUES AND VISIT TO A MALTING PLANT
BREWHOUSE	MALT HANDLING AND MILLING, MASHING, MASH FILTRATION, WORT BOILING AND SEPARATION, WORT COOLING AND AERATION, WORT QUALITY AND ANALYSES, BREWHOUSE CHEMISTRY AND CALCULATIONS, USE OF EXTERNAL ENZYMES, BEER STYLES, RECIPE DEVELOPMENT, SENSORY EVALUATION, PROCESS ANALYTICAL TECHNIQUES, HEALTH & SAFETY, PRACTICAL PILOT BREWING, LABORATORY EXERCISES AND A VISIT TO A BREWERY
FERMENTATION	FERMENTATION TECHNOLOGY, FERMENTATION MICROBIOLOGY AND CHEMISTRY, YEAST MANAGEMENT AND BREEDING, BIOLOGICAL CONTROL, TANKS & PIPE SYSTEMS, STATISTICAL PROCESS CONTROL, REGULATIONS, HEALTH & SAFETY, BEER & HEALTH AND VISIT TO A BREWERY
BEER PROCESSING	FILTRATION THEORY AND PRACTICE, STABILIZATION, HIGH GRAVITY BREWING, CARBONATION, BRIGHT BEER CELLAR, BEER CHEMISTRY AND ANALYSES, BEER CALCULATIONS, BEER STYLES, NEW PRODUCT DEVELOPMENT (NPD) AND LABORATORY EXERCISES
PACKAGING	PACKAGING MATERIALS, PACKAGING LINES, BOTTLE WASHER, BOTTLE FILLING, LABELLING, PASTEURISATION, EMPTY AND FULL INSPECTION, PACKAGING ROBOTS, CANNING, KEGGING, PET BLOW MOULDING AND FILLING, SECONDARY PACKAGING, WAREHOUSING, BIOLOGICAL CONTROL, PACKAGING MICROBIOLOGY AND ANALYSES, QUALITY MANAGEMENT, BULK BEER AND VISIT TO A PACKAGING PLANT
UTILITIES	MECHANICAL AND ELECTRICAL UTILITIES, PROCESS CONTROL, ENERGY AND WATER, RESOURCE MANAGEMENT, ENVIRONMENT AND WASTE WATER TREATMENT, PUMPS AND CAPACITY CALCULATION OF A STANDARD BREWERY

Syllabus of the Master Brewer education



CERTIFIED BREWER EDUCATION

SSB also offers a Certified Brewer education with half of the syllabus of the Master Brewer education. The Certified Brewer also takes place at University of Copenhagen, combined with the Master Brewer classes. The focus is on brewing technology, which is in the first part of each module, so that the second part only for the master students includes a more scientific and advanced perspective. To become a Certified Brewer, the student needs to make an individual project in his/her brewery. The Certified Brewer education has been designed to further educate craft brewers and is described in more detail in an article in SBR, vol.74 No.3, 2017, p. 26-27.

DIPLOMA CRAFT BREWER

Since 2006, SSB has educated more than 180 Diploma Craft Brewers. The education was established for Nordic craft- and microbrewers. The education consists of two modules with 3-4 months in between. In the period between the modules, the student makes a project in his/her own brewery and presents it for the other students in the second module. The evaluation is based on the results from the final exam and the project report and is pass/no pass.

CENSORS

The three qualifying educations described above are all evaluated by a censor. The censors for the Master Brewer

courses are all educated master brewers from SSB with a relevant education at master level and they are appointed and approved by the university's board of examiners. Censors for the Certified Brewer and Diploma Craft Brewer educations are also educated master brewers and are appointed and approved by the director of SSB.

OTHER COURSES

SSB offers shorter courses in beer brewing, flavour evaluation, soft drinks, cider making and distilling spirits. The three-day course Beer Brewing Basics is for newcomers to the brewing industry and especially people in finance, marketing, accounting or similar. The course has been running for decades at SSB and was formerly a 5-day course entitled Brewing Course.

SSB has offered a new course in 2019: the Distilled Spirits course. It is a 3-day course with the main lecturers from Heriot-Watt University in Edinburgh, Scotland. The course also includes a visit to a distillery in Denmark. The first course proved to be a success and will be repeated in 2020.

The one-day Beer Flavour Evaluation course has been extended with two more one-day courses: Beer Flavour Evaluation 2 and Sensory Panel Leader. When participants have completed all three courses, they qualify for Diploma Sensory Panel Leader.



Kaspar Schulz Pilot brewing plant at University of Copenhagen, FOOD



Every second year, SSB offers Traditional Cider Making in the odd years and Soft Drinks Technology in the even years. The duration of both courses is three days and visits are included. SSB offers tailor-made courses at the premises of the specific customer. In recent years, SSB has run courses for first-line leaders, craft brewers, managers and other people in the brewing industry in countries such as Norway, Sweden, Finland, United Kingdom, Portugal, Bulgaria, Ethiopia, India, Laos and China. An inspiration list of course subjects from previous courses is available on the SSB homepage.

E-LEARNING

At SSB, we have been considering for some time whether we should engage in e-learning or distance learning over the computer. In 2019, the board decided to start developing e-learning for the most basic of our beer brewing courses: Beer Brewing Basics. The decision was made upon request from our stakeholders among the breweries. It is a trend in many kinds of educations and courses that participants want to take the course on the computer instead of being away from work for up to maybe two to three weeks at a time. This is difficult in most jobs in the present-day work environment and requirements from employers. The first e-learning course will be launched during the autumn of 2020. The second step will be to make e-learning elements for the Certified Brewer education, but presence learning will still be required in shorter and more concentrated sessions of a few days. This concept of blended learning will slowly be introduced from the spring of 2021.

PUBLICATIONS AND TOOLS

In 2019, SSB published a text book, “Master Brewers Packaging Line Companion” by Knud-Erik Pedersen, who has taught Master Brewer students the subjects for three decades. The book is used in the Master Brewer courses as well as in the Certified Brewer courses and is available from the homepage.

At infrequent intervals, SSB also writes technical papers. Some of the recent papers are available from the homepage.

The Scandinavian Beer Calculator is a tool administered by SSB – see www.beercalc.com. The beer calculator is now also available as an App (SSB Beer Calc), free of charge for Android as well as for iPhone.

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MORE INFORMATION

For more information, please refer to our homepage and social media:

www.brewingschool.org

www.linkedin.com/company/the-scandinavian-school-of-brewing

www.facebook.com/brewingschool.dk

www.instagram.com/brewingschooldk

ABOUT THE AUTHOR



Kim L. Johansen is educated chemical engineer from Danish Technical University and Diploma in Brewing from Institute of Brewing and Distilling. Kim has been working with engineering projects and consultancy with

Alfred Jørgensen, Danbrew and Alecia. Since 2008, Kim has been Training Manager with SSB and leader of the school since June 2017. In his spare time, Kim is cider maker.