

Brewing in a Nutshell – ONLINE



VLB
BERLIN

Self-directed online seminar about the basics of beer brewing:
Raw materials / Malting / Brewing / Filling / Beer styles & quality

Scope: about 10 hours, to be finished within 3 weeks

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eLearning



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www.vlb-berlin.org/en/bianso

Versuchs- und Lehranstalt für Brauerei in Berlin (VLB) / Berlin – Germany

■ Course outline

“Brewing in a Nutshell – Online” is a 100% online course providing detailed basic knowledge of beer brewing. It covers the general principals of the brewing and malting processes, the raw materials and filling as well as packaging in theory.

The course consists of eight thematic learning units made up of seven and a half hours of high-quality video lectures held by our VLB instructors. On top, there are illustrated informative texts, graphics, additional material and more than 100 topic-related questions that the participant has to answer.

The course language is English.

■ Course concept

The course is based on our German and English in-person course, which more than 1200 participants have successfully completed since 1996.

The total study time takes about nine to ten hours. From the time of the first login at our e-learning platform, the participant has 3 weeks in total to work

on all eight learning units. In this way, each participant has the opportunity to determine his/her own learning times and speed. In order to support the learning success, the user can download a handout (pdf) which includes the charts of all lectures.

At the end of each subunit, the learning progress is revised in the form of a small topic-related test. The tests consist of multiple or single choice questions, drag & drop texts or open questions.

The course is successfully completed, when the participant has passed all learning modules.

■ Who should attend?

“Brewing in a Nutshell – Online” is aimed at people who do not need specific brewing training, but who have to deal professionally with the product beer.

This can include employees from sales, marketing, administration or others, working at breweries, maltings, the supply industry or at associations, who need to have general insight into the „secrets“ of beer brewing. But it is also

suitable to provide a general overview of the complete process and technology of beer brewing.

Please be aware that this course is not aimed at home brewers! Hands-on brewing or development of different kinds of beer styles are not part of this training.

■ Our competence

The VLB Berlin (Research and Teaching Institute for Brewing in Berlin) – founded in 1883 – is a German institute focusing on beer brewing and beverage production.

As a „Registered Association“, VLB is an independent institute, which co-operates with Technische Universität Berlin (Technical University of Berlin) in the field of brewing science and has a very large network of the national and international brewing sector and related industry.

Today, around 135 people work in the fields of research and teaching, providing service and information for the brewing, malting and beverage sector and its allied industries.

■ Our lecturers

All lecturers are part of our VLB-team and experienced in teaching, researching and consulting on all aspects of brewing:

- **Chris Bergtholdt** (VLB Certified Brewmaster) – Research Associate and Teacher
- **Dipl.-Ing. Jan Biering** (Brewing Engineer) – Head of VLB Research Institute for Beer and Beverage Production, Senior Consultant and Teacher
- **Roberto Biurrun** (Brewmaster) – Executive International Sales Manager at VLB, Senior Consultant
- **Patrícia Diniz Fischer** (M.Sc. Chemical Engineering) – Team Leader Sensory and Teacher
- **Dipl.-Ing. Burghard Meyer** (Brewing Engineer) – Research Associate, Headteacher international brewing courses
- **Dr. Georg Wenk** (Brewing Engineer) Research Associate, Senior Consultant and Teacher
- **Dipl.-Ing. Philipp Zeuschner** (Dipl.-Braumeister) – Research Associate, Senior Consultant and Teacher



■ Attendance fee & registration

The net fee for this is 390 € (plus tax depending on your residence). We grant a 10 % discount for VLB members. The fee includes the login for one person in a period of three weeks. If the course was completed successfully, the participant will receive a Certificate of Attendance.

Corporate rates:

For companies and larger groups of participants we offer a corporate rate. Prices and conditions on request.

Registration:

Online at
www.vlb-berlin.org/en/bianso



1 Introduction

(15 minutes, 9 questions)

- What is beer?
- The world beer market
- History of beer production
- A general beer production scheme

2 Raw materials for beer production

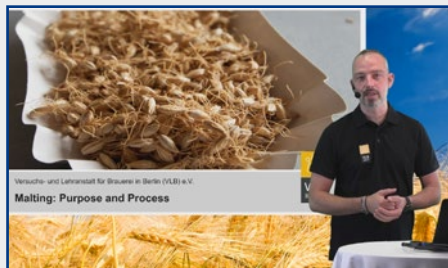
(20 minutes, 21 questions)

2.1 Barley and other cereals

- Barley and malt – what's the difference?
- Malting barley
- Other cereals & adjuncts

2.2 Hops

- Hop growing
- Hop cone – structure
- Hop composition
- Hop processing



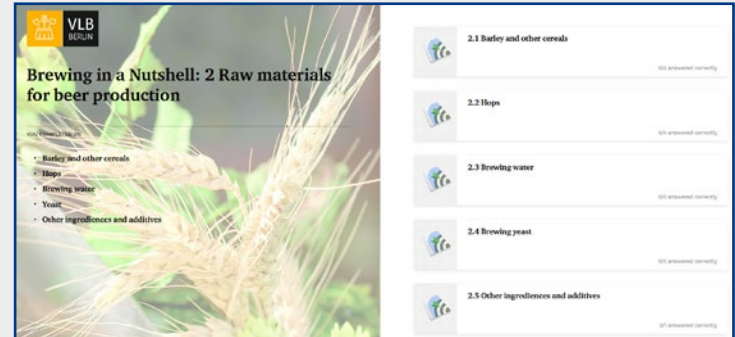
2.3 Brewing water

- Composition of water
- Important parameters of water
- Requirements on brewing water

2.4 Brewing yeast

- What is yeast?
- Cell structure
- Brewing Yeasts
- Yeast cells

2.5. Other ingredients and additives



3 Malting – from grain to malt

(25 minutes, 11 questions)

3.1 Malting: Purpose & process (1)

- How to produce alcohol?
- Composition of barley
- Enzymes
- Malting process
- Barley cleaning
- Steeping

3.2 Malting: Purpose & process (2)

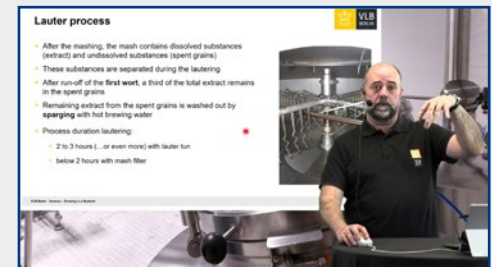
- Germination
- Rootlets and acrospires
- Malt modification
- Modification of cell walls
- Germination systems
- Kilning
- Further malt processing

3.3 Malt types

- Different malt types for different beer styles

3.4 Malt quality

- Hand evaluation
- Mechanical examinations
- Parameters of a chemical-technical malt analysis



Brewing in a Nutshell: 3 Malting – from grain to malt

- Malting Purpose & processes
- Malt types
- Malt quality

4 Wort production

(113 minutes, 19 questions)

4.1 Malt storage & milling

- Malt intake
- Malt preparation
- Wet milling
- Dry milling

4.2 Mashing

- Degradation of starch
- Extraction of malt
- Structure of starch
- Enzymes / Sugar degradation
- Protein degradation
- Mashing process

- Infusion mashing
- Decoction mashing
- Adjuncts
- Mashing equipment

4.3 Lautering

- Lauter process
- Lauter tun
- False bottom
- Raking device
- Run-off pipes
- Process steps
- Process control
- Mash filter
- Lauter tun vs. mash filter

Brewing in a Nutshell: 4 Wort production in the brew house

- Malt storage & Milling
- Mashing
- Lautering
- Wort boiling
- Wort treatment

4.4 Wort boiling

- Main targets
- Conversion of bitter acids
- Protein coagulation
- Evaporation of volatile substances
- Wort concentration
- Other effects
- Wort kettle types
- Internal/external boiler systems
- Other boiling systems
- Hop dosage

4.5 Wort treatment

- Hot trub removal
- Whirlpool
- Wort cooling
- Wort aeration

Q 4.3: What are spent grains?

Only one option is correct:

- The milled malt grit
- The liquid from the mashing process
- All remaining undissolved substances from the malt
- Another weed for malt

Submit

Q 5.1: Complete the sentences about yeast!

Bottom fermenting yeasts	<input type="text"/>	produce less fermentation by-products
Bottom fermenting yeasts	<input type="text"/>	prefer higher temperatures
Top fermenting yeasts	<input type="text"/>	prefer lower temperatures
Top fermenting yeasts	<input type="text"/>	produce more fermentation by-products

Submit

Wort kettle types

Direct firing

The image shows a diagram of a wort kettle with a direct firing system and a video of a man in a vest explaining the process in a brewery setting.

Brewing in a Nutshell: 5 Fermentation & maturation

- Basics & biochemistry
- Yeast management & propagation
- Fermentation process & technology

5 Fermentation and Maturation

(53 minutes, 11 questions)

5.1 Basics & biochemistry

- Basic targets
- Alcoholic fermentation
- Respiration
- Yeast multiplication
- Bottom / top fermentation
- Degree of attenuation
- Biochemical changes
- Diacetyl degradation

5.2 Yeast management & propagation

- Yeast quality & vitality
- Pure yeast cultures

- Yeast properties
- Yeast propagation – history
- Yeast propagation from lab
- Yeast propagation plants
- Yeast harvest and treatment
- Yeast storage

5.3 Process & technology

- Fermentation vessels
- Open fermenter
- Horizontal fermentation tanks
- Disadvantages of traditional fermentation
- Cyllindro conical tanks (CCT)
- Tank farms
- CO₂ recovery

Brewing in a Nutshell: 6 Beer filtration, stabilization & treatment

- Beer filtration
- Beer stabilization & treatment

6 Filtration, Stabilization & Beer Treatment

(64 minutes, 10 questions)

6.1 Beer filtration

- Why filtration?
- Types of filtration
- Particle sizes
- Methods of beer clarification
- Kieselguhr (DE) filtration
- Cross flow membrane filtration
- Other filter types

6.2 Beer stabilization & treatment

- Why beer stabilization?
- Colloidal beer stabilization
- Biological beer stabilization

- De-alcoholisation of beer
- Blending (high gravity brewing)
- Carbonation

7 Filling the Beer

(87 minutes, 10 questions)

7.1 Filling in glass bottles

- Filling line – layout
- Chain conveyor
- Bottle cleaning machine
- Empty bottle inspection
- Filling & closing machine
- Filling process of a bottle
- Bottle closing (crown corks)
- Filling level check
- Tunnel pasteurizer

Particle sizes in the brewery

- Bacteria: 0.5 – 1 x 1 – 5 µm
- Yeast cells: 4 – 10 µm
- Kieselguhr:
 - fine: 2 – 10 µm
 - medium: 10 – 20 µm
 - coarse: 30 – 100 µm
- Filter medium for DE: 30 – 60 µm

Q 5.2: What are the major aims of yeast management?

- Provide a constant supply of active pitching yeast for the brew house process
- Provide a constant supply of active pitching yeast for the fermentation process
- Provide a pure yeast culture without any other contamination
- Provide a mixed culture of yeast and lactic bacteria

Submit

Phase 1: Sanitization & CO₂ purging

Phase 2: Counter pressurizing

Phase 3: Start filling

Phase 4: End filling

Phase 5: Pressure release

- Labeling machine
 - Final packaging
- 7.2. Filling of cans and plastic bottles**
- Filling of metal cans
 - Filling of plastic bottles (PET)
- 7.3 Filling in Kegs**

- Different kegs / barrels
- Stainless steel keg
- One-way kegs
- Plastic kegs (PET)
- Keg fittings / couplers
- Keg cleaning & filling
- Keg filling lines

- analysis
- Alcohol / extract / original gravity
 - Beer color
 - pH value
 - Bitterness
 - Turbidity
 - Beer foam
 - CO₂ / O₂

- 8.2 Dispensing systems**
- Cooling unit
 - CO₂ supply
 - Pressure regulator
 - Connecting the keg
 - Glass washing
 - Different beer taps

8 Beer types, beer quality and dispensing systems

(90 minutes, 15 questions)

8.1 Beer quality

- Basic quality aims
- Information on beer labels
- Types of quality controls
- Chemical technical

8.3 Basics of beer sensory

- What is sensory analysis?
- Sensory training
- Human senses
- Basis tastes
- Our tongue
- Beer flavours – overview: Linalool / Isovaleric acid / Acetaldehyde / Diacetyl / Isobutyraldehyde / Dimethyl sulfide (DMS) / Metallic flavours / Flavour stability / Trans-2-nonenal / 3-MBT
- Sensory evaluation methods
- Testing schemes


8.4 Characteristic beer styles

- Pilsner beers
- Lager beers (Export)
- Bock beers
- Keller beer
- Ales
- Weizen (wheat) beer
- Belgian style wheat beer
- American style wheat beer
- Pale ales / IPA
- Stout / Porter
- Stadler (Shandy)
- Alcohol-free beers

Brewing in a Nutshell Online Autoren -

The fundamentals of malt and beer production. "Brewing in a Nutshell" is an online course providing the basics of beer brewing. It covers the general principles of the brewing and matting processes, the raw materials and filling and packaging in theory.

Content Info Learning Progress



Calendar

◀ Dec 2021 ▶						
Mo	Tu	We	Th	Fr	Sa	Su
	1	2	3	4	5	
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

CONTENT


- Welcome & Introduction
Introduction and hints how to use this platform.
- Introduction into the World of Beer
What is Beer? - The world beer market - History of beer production - A general beer production scheme
- Raw materials for beer production
Barley and other cereals - Hops - Brewing water - Yeast - other ingredients and additives
- Malting - from grain to malt
Purpose and process of malting - Malt types - Malt quality
- Wort production in the brew house

Contact

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 www.vlb-berlin.org/en/bianso

CERTIFICATE OF ATTENDANCE



Dr. Jane Doe

has successfully finished our course


Brewing in a Nutshell Online

In this 9-hour online course the following topics were covered:



- What is beer?
- Raw materials for beer production
- Malting – from grain to malt
- Wort production
- Fermentation and maturation
- Filtration, stabilization & beer treatment
- Filling the beer
- Beer types, beer quality and dispensing systems

VLB Virtual Campus Program

15. Jan 2022




Dr. Josef Kemnitz
Managing Director

VERSUCHS- UND LEHRANSTALT FÜR BRAUEREI IN BERLIN
SEESTRASSE 13 · 13353 BERLIN · GERMANY

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