

M.Sc. Course on Malting and Brewing

Introduction

We offer a 4 week international MSc level course on Malting and Brewing Technology. The objective of this course is to provide a theory basis and to update your knowledge of malting and brewing technology, provide you with up to date information about the state of the important processing steps and improve your skills in designing and trouble-shooting malting and brewing processes. The course (in English) covers the whole field of malting and brewing and includes several practical sessions (including brewing your own beer in our 5 hl. pilot brewery). As a student you will:

- get a clear view on the total malting and brewing process,
- learn knows the most important properties (biological/physiological/(bio)chemical/technological) of barley, malt, water, hops, and yeast as raw materials in brewing and will be capable to evaluate their quality,
- understand the technological questions in respect of steeping, germination and kilning, respectively, and modern industrial practice of malting,
- gain insight in the relation between the malting process and the final malt quality,
- know the main properties of the different malt types and other raw materials (adjuncts) used in beer preparation,
- gain theoretical and practical insight in the whole brewing process (milling of malt, mashing, wort filtration, wort boiling, wort clarification, wort cooling),
- gain theoretical and practical insight in the biochemistry of fermentation, yeast propagation, fermentation technology, lagering, beer clarification, stabilisation, and packaging,
- understand the connection between the malting and brewing process and malting/brewing in relation to the final beer quality,
- gain insight in conceptual engineering in malting, brewing, and fermentation, aiming at enhanced flavour quality/stability and total cost reduction in combination with clean label technology,
- learn to evaluate analytically the raw materials used in beer preparation (malt, hops, yeast),
- gain practical experience in pilot brewing and will be capable to evaluate the different steps of the brewing process: wort production (including determination of brewhouse yield), yeast propagation, fermentation, lagering, beer clarification, beer filling, bottle refermentation),
- be able to perform basic sensory assessment (recognition of flavours and off-flavours and evaluation of fresh vs. aged beers)

Date, Venue & Course fee

The next course will be held at the Leuven University Technology Campus in Ghent from **November 21st 2016, - December 16th 2016**. The course fee is € 2500,- and includes all course materials but excludes travel & accomodation. The next course in English will be held at the Leuven University Technology Campus in Gent from August 21 - September 15, 2017. If you want to attend, please contact Monika Polanska at Monika.Polanska@kuleuven.be. Please note, a maximum of 30 students will be the limit.

Travel & accommodation

Belgium's International Airport is situated in Brussels-Zaventem, only 45 minutes away from Ghent and has flights from over 80 destinations, operated by more than 140 international and regional airline companies. For Europe, Brussels Airlines provides an interesting budget option called b.light economy. Charleroi (Brussels South) is another Belgian Airport serving several European destinations through low-budget companies such as Ryan Air and Wizz Air. Both airports have direct or easy train connections to Ghent (Sint-Pieters). More info and booking: brusselsairport.be or charleroi-airport.com. From the airport, take the train until Ghent using Belgian Railways. There are two railway stations in Ghent. Station Sint-Pieters, Ghent Continue with tram 4, 24, 1 or bus 65, 69 Station Dampoort, Ghent Continue with bus 3, 17, 18, 38 or 39 till Begijnhoflaan (and then a short walk to the Gebroeders De Smetstraat 1).

For information about long stay accommodation during the course please contact:

Ms. Monika Polanska Monika.Polanska@kuleuven.be

Please mention "Malting and Brewing Course 2017" in the subject

Registration & Contact

You can subscribe by mail, using the email address Monika.Polanska@kuleuven.be. Please mention your name, full address and email address. We will send you the invoice and the time schedule of the course by email.

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Lecture program

#	Topic	Lecturer
1	INTRODUCTION TO BEER, MALTING AND BREWING	Prof. Dr. G. Aerts
2	PRE-PROCESSED WORT INGREDIENTS PRE-CONDITIONED PROPAGATED YEAST PACKAGING MATERIALS	Prof. Dr. G. Aerts
3	WATER IN MALTINGS AND BREWERIES ANIONS, CATIONS, METAL CATALYSTS WATER- AND EFFLUENT MANAGEMENT	Dr.Ing. G. De Rouck
4	HOPS AND HOP PRODUCTS	Prof.Dr. Luc De Cooman
5	MALTING BARLEY POST-HARVEST CONDITIONING AND DRY PRETREATMENTS	Prof.Dr. Luc De Cooman
6	MALTING STEEPING AND GERMINATION	Prof.Dr. Luc De Cooman
7	MALTING STEEPING AND GERMINATION	Prof.Dr. Luc De Cooman
8	MALTING DRYING AND KILNING IN SINGLE FLOOR KILNS PALE LAGER MALT	Prof.Dr. Luc De Cooman
9	SPECIAL MALTS, MALT PRODUCTS, AND ADJUNCTS	Prof.Dr. Luc De Cooman
10	SWEET WORT PRODUCTION STIRRED AND TRANSFERRED MASHES	Prof. Dr. G. Aerts
11	SWEET WORT PRODUCTION BIOCHEMICAL BACKGROUND	Prof. Dr. G. Aerts
12	WORT PRODUCTION BATCH WISE OPERATED MASH FILTRATION STIRRED AND TRANSFERRED MASHES	Dr.Ing. G. De Rouck
13	WORT PRODUCTION BATCH WISE OPERATED FROM SWEET WORT TO PITCHING WORT WORT BOILING AND CLARIFICATION	Dr.Ing. G. De Rouck
14	FERMENTATION OF WORT BY <i>SACCHAROMYCES CEREVISIAE</i>	Prof. Dr. G. Aerts
15	FERMENTATION (BATCH WISE) YEAST PROPAGATION AND FERMENTATION TECHNOLOGY	Dr.Ing. G. De Rouck
16	CONDITIONING AND CLARIFICATION	Dr.Ing. G. De Rouck
17	BREWER'S KNOWLEDGE WITH REGARD TO COLLOIDAL STABILITY AND COLLOIDAL STABILISATION	Prof.Dr. Luc De Cooman
18	MALT QUALITY AND BEER FOAM QUALITY	Prof. Dr. G. Aerts

Practical sessions

- Lab sessions on malt and hops
- Brewing your own beer on pilot scale (5 hl. brewery)
- Tasting of Belgian specialty beers