

SEA-ABT: SOUTH EAST ASIA ACADEMY FOR BEVERAGE TECHNOLOGY

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Deliverable D2.1

Report on developed HE products

Prepared by: Hochschule Geisenheim (HGU)

Contributors: Frank Will (HGU); Line Lindner (BOKU)

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Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including Commission services and projects reviewers)	
CO	Confidential, only for members of the consortium (including EACEA and Commission services and projects reviewers)	

Summary:

This deliverable *D2.1 – Report on developed HE products* follows from *D1.4 – Specifications for all modules, courses and educational products* within which the HE modules in the Graduate Diploma in Beverage Technology & Management have been designed and detailed described. In *D2.1*, all the developed HE modules – which have been evaluated by the EU partners - are specified with regard to learning outcomes, content, teaching and learning methods, language, available teaching materials, assessment method and evaluation, qualification and skill requirements for teacher, previous knowledge expected and workload for students. All this data will be made available in a web database maintained by the Academy.

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Project Coordinator:

GERHARD SCHLEINING | BOKU – Universitaet fuer Bodenkultur Wien |
gerhard.schleining@boku.ac.at

1.1 Food law and regulation

Module	Food Law and Regulations
Person responsible	Kriskamol Na Jom
Learning outcomes	<ul style="list-style-type: none"> • Understanding both domestic and international laws and regulations related beverages • Achieve the way to search related websites and documents to locate information correlated to laws, standards and regulations related to beverages • Apply knowledge of relation while developing new beverage products or seeking the approval of new beverage products
Content	Domestic & International Food Law and Regulations related to food additives, beverage manufacturing and packaging
Teaching and learning methods	<ul style="list-style-type: none"> - Lecture - Case study - Role playing and discussion - Sharing of ideas and brainstorming aspects by a project
Language	Thai/English
Teaching materials	Clip video, Youtube, Newspaper, Magazine, Kahoot or Game, Power point
Assessment method and evaluation	Written examination and oral presentation of assignment
Qualification and skill requirements for teacher	<ul style="list-style-type: none"> - Ph.D. qualification with teaching experience in food law, food standard, food regulation etc. - Senior experts from some related organization i.e. FDA, FAO - Language competence in both Thai and English
Previous knowledge expected and workload for students	None
Further information	
Available	Link to database (Academy)

1.2 Non-Alcoholic Beverage Technology

Module	Non-Alcoholic Beverage Technology
Person responsible	Sasitorn Tongchitpakdee, KU
Learning outcomes	Students understand principle processing, characteristics, quality standards and safety criteria for non-alcoholic beverages, including juices, dairy-based beverages, soft drinks, energy drinks, coffee, tea, etc.
Content	Juices, dairy-based beverages, soft drinks, energy drinks, coffee, tea, etc. n the aspects of chemical composition, classification, raw materials and ingredients, processing step, current and new technology related to production, quality standards and safety criteria, factors affecting shelf life of products.
Teaching and learning methods	
Language	Thai/English
Teaching materials	
Assessment method and evaluation	Written or oral examination
Qualification and skill requirements for teacher	
Previous knowledge expected and workload for students	None
Further information	
Available	Link to database (Academy)

1.3 Alcoholic beverage technology

Module	Alcoholic Beverage Technology
Person responsible	Sumallika Morakul, KU
Learning outcomes	<ul style="list-style-type: none"> • Understand principle of alcohol beverage processing, including wine, beer, spirits and related drinks • Know how to control the quality of product • Can identify the problem and its solution properly
Content	<ul style="list-style-type: none"> • Principle of wine, beer, spirit and related drink production • Process control • Product quality control and analytical method • Nutrition and health aspects • Trends and developments
Teaching and learning methods	
Language	Thai/English
Teaching materials	
Assessment method and evaluation	<p>written examination 50% oral presentation 25% course attendance 5%</p> <p>The overall score must higher than 50% to pass the course</p> <p>A: 80% up B:70-79% C:60-69% D:50-59% F<50</p>
Qualification and skill requirements for teacher	
Previous knowledge expected and workload for students	None
Further information	
Available	Link to database (Academy)

1.4 Product and Process Development

Module	Product and Process Development
Person responsible	Chaleeda Borompichaichartkul (CU)
Learning outcomes	<ul style="list-style-type: none"> • Capability to understand and gain experience in the process of beverage product and process development • Capability to integrate knowledge in chemistry, microbiology, processing, packaging and engineering concepts in beverage product and process development • Capability to identify challenges involved in beverage product and process development • Understanding techniques and knowledge related to basic consumer research and marketing concerns in beverage industry • Capability to prepare a prototype or concept of new beverage product and process • Understanding concept of sustainable waste management and by-product utilization from beverage industry • Capability to develop and enhance team cooperation and communication skills
Content	<ul style="list-style-type: none"> • Introduction: types of product development , significance to beverage industry, product policy and goals, product failure and success • Generating and screening of new product ideas • Product concept and concept testing • Development of prototype product: information search, feasibility, detailed process and packaging • Process development • Experimentation in prototype development • Sensory Analysis and consumer testing • Shelf life study • Sustainable waste management and by-product utilization
Teaching and learning methods	<ul style="list-style-type: none"> • PowerPoint Presentation • E-learning
Language	Thai/English
Teaching materials	<ul style="list-style-type: none"> • Lecture note • Book • Online materials
Assessment method and evaluation	<ul style="list-style-type: none"> • Course assignment • Oral presentation • Written examination • Participation during contact hours
Qualification and skill requirements	<ul style="list-style-type: none"> • Ph.D in Food Technology, Food Science and Technology, Biotechnology or related field <i>or</i>

for teacher	<ul style="list-style-type: none"> • Having experience in the product development of food factory for at least 5 years
Previous knowledge expected and workload for students	<ul style="list-style-type: none"> • Unit operation and automation • Beverage chemistry and microbiology
Further information	
Available	Link to database (Academy)

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1.5 Hygienic Engineering and Design

Module	Hygienic Engineering and Design
Person responsible	Navaphattra Nunak (KMITL)
Learning outcomes	<ul style="list-style-type: none"> • Understand principle measurement, instrumentation and automation used in beverage industry • Understand law & regulations for food machinery design, Material of construction for equipment in contact with food • Design and specify the specifications of factory building, piping system and other equipment related to beverage factory. • Understand cleaning and disinfection for beverage factory.
Content	Basic engineering; Fluid mechanics, measurement and instrumentation and automation system for beverage technology, Law & Regulations for food machinery design, Material of construction for equipment in contact with food, Hygienic equipment design and installation.
Teaching and learning methods	
Language	Thai/English
Teaching materials	
Assessment method and evaluation	Oral assessment of the learning outcomes
Qualification and skill requirements for teacher	
Previous knowledge expected and workload for students	Unit operations, microbiology
Further information	
Available	Link to database (Academy)

1.6 Quality Assurance and Quality Control

Module	Quality Assurance and Quality Control
Person responsible	Chaleeda Borompichaichartkul (CU)
Learning outcomes	<ul style="list-style-type: none"> • Understanding the principles of quality control and quality assurance in the beverage industry • Capability to diagnose and analyze problems causing variation in beverage manufacturing process • Understanding the standard quality analysis tools and techniques • Understanding the complexities of statistical analysis and control-chart interpretation and application
Content	<ul style="list-style-type: none"> • Food quality: importance and functions of quality control and quality assurance • Types of risks associated with food and beverage • Overview of food quality and safety assurance systems • Principles of aspects of sampling plan, sample collection techniques, sampling tools and documentation • Methods of quality assessment of raw materials, in-process and finished products : physical, chemical and microbiological properties assessment • Principles of sensory analysis in quality control • Statistical methods for food and beverage quality control • Current challenges in quality, safety, fraud and adulteration in beverage industry
Teaching and learning methods	<ul style="list-style-type: none"> • PowerPoint Presentation • E-learning
Language	Thai/English
Teaching materials	<ul style="list-style-type: none"> • Lecture note • Book • Online materials • Clip VDO of case study
Assessment method and evaluation	<ul style="list-style-type: none"> • Course assignment • Oral presentation • Written examination • Participation during contact hours
Qualification and skill requirements for teacher	<ul style="list-style-type: none"> • Ph.D in Food Technology, Food Science and Technology, Biotechnology or related field <i>or</i> • Having experience in the QA/QC of food factory for at least 5 years
Previous knowledge expected and workload for students	<ul style="list-style-type: none"> • Beverage chemistry and microbiology • Practical LAB in beverage industry

Further information	
Available	Link to database (Academy)

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1.7 Beverage Chemistry and Microbiology

Module	Beverage Chemistry and Microbiology
Person responsible	Kriskamol Na Jom (KU)
Learning outcomes	<ul style="list-style-type: none"> - Understand the chemistry of different beverages - Understand the microbiology of different beverages - Understand the basics of shelf life prediction
Content	Principle of chemistry for beverage e.g. colloid, additives, preservatives, principle of microbiology for beverage, shelf-life
Teaching and learning methods	<ul style="list-style-type: none"> - Lecture - Workshop - Field trip - Case studies - Projects
Language	Thai/English
Teaching materials	Clip video, Youtube, Newspaper, Magazine, Kahoot or Game, Power point
Assessment method and evaluation	Written examination and oral presentation of term project
Qualification and skill requirements for teacher	<ul style="list-style-type: none"> - Ph.D. qualification in Food Science and Technology or related filed with teaching experience in food chemistry, food analysis and food microbiology - Senior experts from some related organization i.e. National Food Institute - Language competence in both Thai and English
Previous knowledge expected and workload for students	None
Further information	
Available	Link to database (Academy)

1.8 Target Marketing and Strategic Pricing for Beverage Industry

Module	Target Marketing and Strategic Pricing for Beverage Industry
Person responsible	TBA
Learning outcomes	-Students understand concept of A target marketing or STP strategy as well as pricing strategy for beverage business.
Content	A target marketing or STP strategy for beverage business. The profit function, willingness to pay and pricing strategy are provided to comply with the target consumers and become a positioning strategy.
Teaching and learning methods	
Language	Thai/English
Teaching materials	
Assessment method and evaluation	Written or oral examination and project work
Qualification and skill requirements for teacher	
Previous knowledge expected and workload for students	None
Further information	
Available	Link to database (Academy)

1.9 Supply Chain Management for Beverage Industry

Module	Supply Chain Management for Beverage Industry
Person responsible	TBA
Learning outcomes	-Students understand supply chain and logistics management for beverage industry
Content	Integration of procurement, logistics network distribution, operations, inventory management, transportation and distribution of beverages from raw materials to consumers. Supply chain operations reference model and supply chain performance measurement. Strategies and tactics in supply chain and logistics management for sustainable development.
Teaching and learning methods	
Language	Thai/English
Teaching materials	
Assessment method and evaluation	Written or oral examination and project work
Qualification and skill requirements for teacher	
Previous knowledge expected and workload for students	None
Further information	
Available	Link to database (Academy)

1.10 Planning and project management for beverage industry

Module	Planning and project management for beverage industry
Person responsible	TBA
Learning outcomes	-Students understand management concepts for beverage operations as well as planning and operational strategy for beverage industry.
Content	Management concepts for beverage operations. Operational strategy, planning and decisions. Process and work-force management. Techniques in site selecting and plant layout, capacity planning, production planning, inventory control and project management for beverage-industry.
Teaching and learning methods	
Language	Thai/English
Teaching materials	
Assessment method and evaluation	Written or oral examination and project work
Qualification and skill requirements for teacher	
Previous knowledge expected and workload for students	None
Further information	
Available	Link to database (Academy)

1.11 Practical Laboratory in beverage industry

Module	Practical Laboratory in beverage industry
Person responsible	Chaleeda Borompichaichartkul
Learning outcomes	<ul style="list-style-type: none"> • Understanding concepts and practices of process involved in the manufacturing of beverages • Understanding the implementation of physical, chemical, microbiological and sensory measurements in beverage industry • Capability to evaluate the impact of manufacturing process on the quality and safety of beverage products • Improving skills in planning and conducting experiments, collecting data, analyzing and interpreting results, and writing technical reports
Content	<ul style="list-style-type: none"> • Introduction to laboratory practice and safety concern • Preparation of raw materials: sorting, peeling, extraction etc. • Thermal process: retort, canning and heat penetration • Pasteurization unit: plate-heat exchanger • UHT pilot plant demonstration • Spray and drum drying system • Concentration by evaporation • Clarification and filtration • Beverage packaging assessment • Analysis of physical, chemical, microbiological and sensory characteristics of beverage products
Teaching and learning methods	<ul style="list-style-type: none"> • PowerPoint Presentation • E-learning
Language	Thai/English
Teaching materials	<ul style="list-style-type: none"> • Laboratory direction • Equipment or instrument demonstration • Clip VDO for demonstrate the process
Assessment method and evaluation	<ul style="list-style-type: none"> • Attendance, technical skill and performance • Laboratory report • Written examination
Qualification and skill requirements for teacher	<ul style="list-style-type: none"> • Ph.D in Food Technology, Food Science and Technology, Biotechnology or related field <i>or</i> • Having experience in the processing unit of beverage industry for at least 5 years
Previous knowledge expected and workload for students	<ul style="list-style-type: none"> • Unit operation and automation • Beverage chemistry and microbiology

Further information	
Available	Link to database (Academy)

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1.12 Seminar

Module	Seminar
Person responsible	Sumallika Morakul (KU)
Learning outcomes	<ul style="list-style-type: none"> • Be able to analyze and comprehend the scientific research papers. • Use scientific database to update or follow the research • Be able to give oral scientific presentation effectively • Write a seminar report as the scientific review paper
Content	<ul style="list-style-type: none"> • Literature reviewing for information related to special problem topics and presenting the literature review
Teaching and learning methods	
Language	Thai/English
Teaching materials	
Assessment method and evaluation	<ul style="list-style-type: none"> • Active discussion and oral presentation 70% • Abstract and final written report 25% • Participation during contact hours 5% <p>The overall score must higher than 50% to pass the course</p> <p>A: $\geq 80\%$ B: 70-79% C: 60-69% D: 50-59% F: < 50</p>
Qualification and skill requirements for teacher	
Previous knowledge expected and workload for students	None
Further information	
Available	Link to database (Academy)

1.13 Special problem

Module	Special Problem
Person responsible	Sarn Settachaimongkon (CU)
Learning outcomes	<ul style="list-style-type: none"> • Capability to identify a research problem in beverage industry • Capability to search and collect relevant information • Understanding how to write a project proposal • Understanding research methodology in beverage technology • Capability to perform critical discussion and interpretation of results • Capability to communicate the outcomes by oral presentation and report
Content	<ul style="list-style-type: none"> • Information literacy including relevant article searching, data collection and reference handling • How to write a project proposal • Research methodology and data interpretation • Scientific documentation and presentation
Teaching and learning methods	<ul style="list-style-type: none"> • Formulate a research problem / hypothesis related to beverage products based on personal / career interest • Submit a research proposal after consultation with supervisor(s) • Conduct a research project (equivalent to B.Sc. thesis level) in the field of interest • Regular consultation with supervisor (s) • Presentation in a final colloquium and submit a final report
Language	Thai/English
Teaching materials	<ul style="list-style-type: none"> • Technical supports / facilities in a hosted university / laboratory • On-line scientific literatures relevant to each project
Assessment method and evaluation	<ul style="list-style-type: none"> • Independent study competence • Progressive works • Active discussion and oral presentation • Final written report • Participation during contact hours
Qualification and skill requirements for teacher	<p>For project supervisors:</p> <ul style="list-style-type: none"> • Ph.D. qualification in Food Sciences, Biotechnology, Agriculture, Engineering or related fields • Language competence in both Thai and English • More than 3 year experience in supervising B.Sc. or higher level thesis projects • Appropriate scientific publication record in

	ISI/SCOPUS/PUBMED etc. database
Previous knowledge expected and workload for students	<ul style="list-style-type: none"> • Product and process development OR • Other related courses according to the consent of faculty
Further information	
Available	Link to database (Academy)

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