



MINISTRY OF EDUCATION AND TRAINING
NGUYEN TAT THANH UNIVERSITY
FACULTY OF ENVIRONMENTAL AND FOOD ENGINEERING
PROGRAM: ENGINEERING IN FOOD TECHNOLOGY

COURSE SPECIFICATION

1) Course information

- Course Name: Beverage Processing Technology
Vietnamese name: Công nghệ chế biến đồ uống
English name: Beverage processing technology
- Course Code: 071246
- Number of credits: 3
- Level: for third-year students
- This course belongs to the program of: Food Technology

2) The course belongs to the following course block:

General <input type="checkbox"/>		Supporting <input type="checkbox"/>		Professional <input checked="" type="checkbox"/>			
				Foundational <input type="checkbox"/>		Specialized <input checked="" type="checkbox"/>	
Mandato ry <input type="checkbox"/>	Electiv e <input type="checkbox"/>	Mandato ry <input type="checkbox"/>	Electiv e <input type="checkbox"/>	Mandato ry <input type="checkbox"/>	Electiv e <input type="checkbox"/>	Mandato ry <input type="checkbox"/>	Elective <input checked="" type="checkbox"/>

3) Detailed time distribution:

- + Theoretical sessions: 30 periods
- + Practical sessions: 15 periods
- + Other activities: (Discussion/Group presentation): 10 periods
- + Self-studying: 90 periods

4) Lecturer in charge of the course:

MSc. Nguyen Thi Thuy Dung

5) Study document

❖ **Required materials/textbooks:**

- (1) Philip R. Ashurst, 2016, Chemistry and technology of soft drinks and fruit juices (third edition), Wiley Blackwell
- (2) Wolfgang Kunze, 2019, Technology Brewing and Malting- 6th revised English edition, VLB Berlin

❖ **Reference materials/textbooks:**

- (1) Le Van Viet Man, 2015, Food processing technology, VNU Publishing House, HCMC

6) Course Information

- *Brief description of the course content*

This course provides students with theoretical and practical knowledge related to water treatment methods and materials involved in the production of wine, beer and beverage products. The course also present and explain the production process of wine, beer and beverage products; the operating principles of equipment and machinery used in the production process. In addition, skills in problem solving, teamwork, information retrieval and reading comprehension are also consolidated and applied in this course.

- *Requirements:*

- + Prerequisite course(s): None
- + Recommended previous course(s):

For students choosing Nutrition and Food Processing specialization: Food Processing Technology

For students choosing in Food Quality, Safety and Traceability specialization: None

+ Con-current courses: None

7) Objectives and expected learning outcomes of the course

- *The course aims to:*

+ Provide knowledge about composition, characteristics, and role of ingredients in the beverage production process; Proposing recipes and implementing technological procedures to create beverage products

+ Train students on: how to plan and manage work time effectively; how to proficiently use equipment and tools to produce beverage products

+ Develop students' willing to learn and innovation, adaptability, and innovative mindset in order to adapt to the changes in beverage production technology.

- *Course expected learning outcomes:*

CLOs	Course Expected Learning Outcomes Upon completion of this course, students will be able to	PLOs
Knowledge		
CLO1	Implement the beverage production process to ensure quality in accordance with the law	PLO2
CLO2	Evaluate the composition, characteristics, and roles of ingredients in the beverage production process	PLO3
CLO3	Propose formulas and technological procedures to create beverage products in a reasonable way	PLO3
Skills		
CLO4	Plan and manage work time effectively in the process of identifying problems; implement procedures in beverage production	PLO6
CLO5	Use equipment and tools proficiently in order to produce beverage products	PLO8
Attitudes and moral qualities		
CLO6	Demonstrate willingness to participate in learning and innovative activities, in order to adapt to changes in beverage production technology.	PLO10

- *The course contributes to the following Program Learning Outcomes (PLOs) of the program at the following levels:*

		The level of contribution of the course to the PLOs

Course Code	Course Name	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
071246	Beverage processing technology		M	M			P		P		M

8) Summary of course content

Week	Lesson content	Course Expected Learning Outcomes
1	<p>Introduction to the course</p> <p>Chapter 1: Water treatment in wine, beer and beverage production technology</p> <p>1.1. Treatment of feed water in wine, beer and beverage production technology</p> <p>1.1.1. Water sources often used in the production of wine, beer, and soft drinks</p> <p>1.1.2. Indicators of water quality</p> <p>1.1.3. Water quality requirements</p> <p>1.1.4. Water treatment methods in wine, beer and beverage production technology</p> <p>1.2. Wastewater treatment in wine, beer and beverage production technology</p> <p>1.2.1. General characteristics of wastewater in wine, beer and beverage production technology</p> <p>1.2.2. The components of wastewater that can impact the environment</p> <p>1.2.3. Methods of wastewater treatment in wine, beer and beverage factories</p> <p>1.2.4. Requirements for wastewater quality</p>	CLO2, CLO4, CLO6
2	<p>Chapter 2. Technology for the production of mixed drinks</p> <p>2.1. Raw materials in the production of mixed drinks</p> <p>2.2. Flowchart of technological processes in the production of mixed beverage</p> <p>2.3. Stages in the beverage production process</p> <p>2.4. Standards for mixed beverage products</p>	CLO2, CLO3, CLO4, CLO6
3	<p>Chapter 3. Beer production technology</p> <p>3.1. Ingredients in beer production</p> <p>3.2. Flow chart of beer production technology</p> <p>3.3. Stages in the beer production process</p>	CLO2, CLO3, CLO4, CLO6

Week	Lesson content	Course Expected Learning Outcomes
4	Chapter 3. Beer production Technology (continued) 3.3. Stages in the beer production process (continued) 3.4. Quality standards for finished beer	CLO2, CLO3, CLO4, CLO6
5	Chapter 4. Wine production technology 4.1. Technology for production of ethyl alcohol 4.1.1. Raw materials for the production of ethyl alcohol 4.1.2. Flowchart of technological processes in for the production of ethylic alcohol 4.1.3. Stages in the production of ethyl alcohol 4.1.4. Ethyl alcohol products	CLO2, CLO3, CLO4, CLO6
6	Chapter 4. Wine production technology (continued) 4.2. Wine production technology 4.2.1. Raw materials for wine production 4.2.2. Flow chart of wine production technology 4.2.3. Stages in the winemaking process 4.1.4. Wine products	CLO2, CLO3, CLO4, CLO6
Practical section		
Week	Lesson content	Course Expected Learning Outcomes
1	Lesson 1: Hydrolysis of ingredients in beer production	CLO1, CLO4, CLO5, CLO6
2	Lesson 2: Houblonization and fermentation in beer production	CLO1, CLO4, CLO5, CLO6
3	Lesson 3: Producing alcohol from starch and fruit	CLO1, CLO4, CLO5, CLO6
4	Lesson 4: Distilling alcohol	CLO1, CLO4, CLO5, CLO6
5	Lesson 5: Producing mixed drinks	CLO1, CLO4, CLO5, CLO6
6	Lesson 6: Producing carbonated soft drinks	CLO1, CLO4, CLO5, CLO6

9) Assessment methods

PPPs	Criteria	Weight (%)	Excellent (100%)	Good (75%)	Average (50%)	Not satisfactory (0%)	Notes
Writing	1.1. Analyzing the role of processing procedures	5%	Provided an accurate analysis of the role of processing procedures	Provided a rather accurate analysis of the role of processing procedures	Provided a somewhat accurate analysis of the role of processing procedures	Unable to analyze the role of processing procedures	
Writing	2.1. Assessing the ingredients, characteristics, and roles of ingredients in the beverage production process	5%	Provided a full assessment of ingredients, characteristics, roles	Provided a rather full assessment of ingredients, characteristics, roles	Provided an assessment of some ingredients, characteristics, roles	Unable to provide an assessment of ingredients, characteristics, roles	
Writing	2.2. Analyzing the degree of change of raw materials during the production process	10%	Provided a full analysis of the changes to raw materials during the production process	Provided an analysis of most changes to raw materials during the production process	Provided an analysis of a few changes to raw materials during the production process	Unable to provide an analysis of the changes to raw materials during the production process	
Writing + Q&A	3.1. Proposing recipes to create beverage products	5%	Proposed a reasonable formula for creating beverage products	Proposed recipes to create beverage products	Suggested a few parameters in the recipe to create beverage products	Unable to suggest a recipe to create a beverage product	
Writing + Q&A	3.2. Proposing the technological processes to create beverage products	10%	Proposed a reasonable process for creating beverage products	Proposed a process for creating beverage products	Suggested a few parameters in the process for creating beverage products	Unable to suggest a process for creating beverage products	
Writing	3.3. Explaining the purpose, variation,	10%	Fully explained the purposes,	Explained most of the purposes,	Explained some of the purposes,	Failed to explain the purposes,	

	technological parameters and specifications of the production process		variations, technological parameters and specifications of the production process	variations, technological parameters and technical requirements of the production process	variations, technological parameters and technical requirements of the production process	variations, technological parameters and technical requirements of the production process	
Writing	3.4. Identifying important technological parameters affecting product quality	5%	Identified all important technological parameters affecting product quality	Identified the majority of important technological parameters affecting product quality	Identified some technological parameters affecting product quality	Unable to identify parameters affecting product quality are not identified	
Writing + Q&A	4.1. Applying critical thinking skills in analyzing and evaluating issues related to beverage production and quality assurance	10%	Solved the problems given by the lecturer with excellent results	Solved the problems given by the lecturer with good results	Solved the problems given by the lecturer with average results	Unable to solve the problems given by the lecturer	
Practicing	5.1. Following instructions	15%	Followed the instructions exactly	Follow the instructions quite correctly	Follow the instructions somewhat correctly	Failed to follow the instructions	
Practicing	5.2. Using tools and equipment in the laboratory	15%	Used laboratory tools and equipment correctly based on instructions	Used laboratory tools and equipment based on instructions	Used laboratory tools and equipment, but did not follow some of the instructions	Unable to use tools and equipment in the laboratory	
Practicing	5.3. Finishing the product within the allotted time	5%	Finished the product on time	Finished a large portion of the product in the allotted time	Satisfied the basic requirements of the product within the allotted time	Failed to finish the product	

Q&A	6.1. Recognizing and updating new roles of ingredients and processes in order to improve the research and development of beverage products	5%	Identified and updated all information about the new roles of ingredients and additives, and new production processes	Identified and updated most information about the new roles of ingredients and additives, and new production processes	Identified and updated some information about the new roles of ingredients and additives, and new production processes. Students needed help from the lecturer.	The new roles of raw materials and additives, and new processing have not been recognized and updated	
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RUBRIC FOR CLASS ATTENDANCE

Criteria	Weight (%)	Excellent 100%	Good 75%	Average 50%	Below average 0%
Participating attitude	50	Actively participate in activities	Participating in activities	Less participation in activities	Do not participate in activities
Full attendance time	50	Missing 1 class deduct 2 points			

RUBRIC ASSESSMENT FOR PRESENTATION

(Individual)

Criteria	Weight (%)	Excellent 100%	Good 75%	Average 50%	Below average 0%
Content	10	Diverse	Full	Quite complete, missing 1 important content	Missing a lot of important content
	20	Precise, scientific	Quite accurate, scientific, there are a few small errors	Relatively accurate, scientific, there is 1 important error	Inaccuracy, science, many important errors
Structure and Intuition	10	Very reasonable structure	Reasonable structure	Relatively reasonable structure	The structure is not reasonable
	10	Very intuitive and aesthetic	Quite intuitive	Relatively intuitive	Very difficult to follow
Presentation skills	20	persuasive, persuasive	clear but not persuasive	Hard to follow but still understandable	The presentation is not clear, the audience cannot understand

InteractiON with listeners	10	Good, report	pretty good, pretty comprehensive	Occasional interaction but not coverage	No interaction/very little
Time management	10	Control the time	Completed on time, some parts are not balanced	Finished on time, but lots of disproportionate parts.	Overtime
Answering the question	10	Answer fully, clearly, and satisfactorily	Most of the answers are correct, there are small errors	Answer some questions correctly, there are important errors	Unable to answer most questions

RUBRIC ASSESSMENT OF THE PRESENTATION

(By group)

Criteria	Weight (%)	Excellent 100%	Good 75%	Average 50%	Below average 0%
Content	10	Richer than required	Full as required	Quite complete, missing 1 important content	Missing a lot of important content
	20	Precise, scientific	Quite accurate, scientific, there are a few small errors	Relatively accurate, scientific, there is 1 important error	Inaccuracy, science, many important errors
Structure and Intuition	10	The structure of the lesson and slides is very reasonable	The structure of the lesson and slides is quite reasonable	The structure of the lesson and slides is quite reasonable	The structure of the lesson and slides is not reasonable
	10	Very intuitive and aesthetic	Quite intuitive and aesthetic	Relatively intuitive and aesthetic	Less/Not intuitive and aesthetic
Presentation skills	10	Lead the issue and argue persuasively	The presentation is clear but not persuasive, the argument is	Difficult to follow but still able to understand	The presentation is not clear, the audience cannot understand the

			quite convincing	important content	important content
Gesture, interaction	10	Good eye contact and gestures	Pretty good eye and gesture interaction	There is eye contact, gesture but not good	No eye or gesture interaction
Time management	10	Master the time and fully adapt to the situation	Completed on time, sometimes with flexibility to adjust to the situation.	Complete on time, not flexible according to the situation.	Overtime
Answer the question	10	Correctly asked questions are answered fully, clearly, and satisfactorily	Answer most of the questions correctly and give appropriate directions for unanswered questions	Answered most of the questions correctly, but did not give appropriate orientation for unanswered questions	Unable to answer most questions correctly
Team coordination	10	The team works well, really shares and supports each other while reporting and responding	The team is coordinated when reporting and answering, but there are still some places that are not synchronized	The group is less coordinated while reporting and responding	Do not show the connection in the group

RUBRIC FOR GROUP DISCUSSION

Criteria	Weight (%)	Excellent 100%	Good 75%	Average 50%	Below average 0%
Attitude to participate	30	Raise the issue and lead the discussion	Join the discussion	Less participation in discussions	Not engaged

Discussion skills	40	Good analysis and evaluation	Analysis and evaluation are quite good	Analyze and evaluate when it's good, when it's not	Analysis and evaluation are not good
Quality of comments	40	Creative, suitable	Fit	Sometimes it's right, sometimes it's not	Not suitable

Rubric : Practical Assessment (Experiment)						
Criteria		Weight (%)	Good 100%	Rather 75%	medium 50%	Least 0%
Diligence and attitude, self-study ability		10	Using Rubric 1 on Assessing attendance and attitude, self-study ability			
Experimental process	Preparation phase	10	Prepare experimental systems proactively and accurately	Prepare the experimental system on the initiative, there are a few small errors	Experimental system preparation has several important flaws	Unprepared
	Stage implementation	20	Follow the correct method	Implemented quite properly, with small errors and corrections	Relatively correct method, significant errors and corrections	Improper implementation of the method, errors cannot be corrected
		10	Understand the meaning of experimental steps, be able to self-correct problems during experimentation	Understand the meaning of experimental steps, be able to troubleshoot problems during experiment when guided	Understand the meaning of experimental steps but still limited	Not understanding the meaning of experimental steps
Report test results	Calculation and processing of experimental results	15	Accurate and complete calculation	The calculation is quite accurate, there are a few small errors	The calculation is relatively accurate, but there are a few important errors	Calculation errors a lot or no calculation

	Explain the results of the experiment	15	Explanations based on solid arguments based on known knowledge	Explanations are based on fairly solid arguments on the basis of known knowledge, but some points are still confusing	Explanations are based on arguments based on known knowledge but many points are not clear	Can't explain
	Using information technology tools in the report of experimental results	10	Use Autocad, Excel, and Word software in reports proficiently	Use Autocad, Excel, and Word software in reports at a basic level	Used but there are many errors	Do not use Okay
	Report presentation format	10	The report is clear, coherent, with few errors	The report is quite clear, with few errors	The report is quite clear, there are many mistakes	The report is not clear, there are many mistakes

10) Scoring scale

Use a 10-point scale for all assessments.

In-class assessment: 20% (the final score is the weighted average of theoretical part and the practical part, calculated based on the number of credits allotted for each part)

Mid-term assessment: 30% (the final score is the weighted average of theoretical part and the practical part, calculated based on the number of credits allotted for each part t)

Assessment at the end of the course: 50% (the final score is the weighted average of theoretical part and the practical part, calculated based on the number of credits allotted for each part)

Minimum score for passing the course: 4/10

11) Other activities

- *Teaching activities*
 - + Lectures
 - + Group discussion
 - + Lab practice
- *Learning activities*
 - + Students read the material by themselves, develop hypotheses and related questions
 - + Students listen to lectures
 - + Students must find reading materials by themselves, and summarize the content they found as preparation for presentations and group discussions
 - + Students are encouraged to use knowledge from other courses and personal experiences to propose solutions to problems presented by the lecturer

- *Student Duties*
 - + Attendance: Students must attend at least 80% of the lessons; go to class on time.
 - + Read the material and prepare for each lesson before attending a theoretical lesson
 - + Complete all exercises on the *lms.ntt.edu.vn* system.
 - + For practical sessions, students must read documents in advance and prepare diagrams, as well as preparing the required chemicals.
 - + Display a willingness to learn, respect for intellectual property, and compliance with laboratory safety guidelines.

12) Lecturer's requirements for the course

- Classroom.
- Teaching aids: Projector, speakers.

Ho Chi Minh city, September 17, 2020

Dean

Head of department

Compiler

Dr. Tran Thi Nhu Trang

MSc. Nguyen Thi Van Linh

MSc. Nguyen Thi Thuy Dung

APPENDIX: LIST OF LECTURERS & TEACHING ASSISTANTS AVAILABLE FOR THE COURSE

Lecturer in charge of the course

First and last name: Nguyen Thi Thuy Dung	Academic Title, Degree: Master's Degree
Office address: 331 National Highway 1A, An Phu Dong, District 12, HCMC	Contact phone: 19002039 (ext. 409)
Email: dungntt@ntt.edu.vn	Website: https://kttpmt.ntt.edu.vn/
How to contact the lecturer: During working hours, from Monday to Friday, at the Office of the Faculty of Food and Environmental Engineering	

Course support lecturer/teaching assistant (if any)

First and last name:	Academic title, degree:
Work address:	Contact phone:
Email:	Webpage:
How to contact the lecturer/ teaching assistant: (Specify methods of communicating between student and the lecturer/assistant)	

Company trainer/instructor (if any)

First and last name:	Academic title, degree:
Work address:	Contact phone:
Email:	Webpage:
How to contact the instructor: (Specify methods of communicating between student and the trainer/instructor)	