PROCESSING TECHNOLOGIES OF BEE PRODUCTS AND QUALITY EVALUATION

1	Course Title:	PROCESSING TECHNOLOGIES OF BEE PRODUCTS AND QUALITY EVALUATION
2	Course Code:	GMB5063
3	Type of Course:	Optional
4	Level of Course:	Second Cycle
5	Year of Study:	1
6	Semester:	1
7	ECTS Credits Allocated:	6.00
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Doç. Dr. PERİHAN YOLCI ÖMEROĞLU
15	Course Lecturers:	Prof.Dr. Ömer Utku ÇOPUR
16	Contact information of the Course Coordinator:	Uludağ Üniversitesi Ziraat Fakültesi Gıda Mühendisliği Bölümü 16059 Görükle/Bursa Tel: 0224 2941501 Fax: 0224 2941402 e-posta: pyomeroglu@uludag.edu.tr
17	Website:	
18	Objective of the Course:	The aim of this course is to teach the students on the subjects including bee products (honey, pollen, royal jelly, bee venom, propolis, apilarnil), their classifications, physicochemical, functional and sensorial properties, conventional and non-conventional processing technologies, factors affecting the quality of bee products, analysis methods, authencity and adulteration, chemometric approaches, processing bee products in to value added new functional foods, national/international legislation.
19	Contribution of the Course to Professional Development:	Students who take this course will acquire theoretical and novel information about the processing of bee products.
20	Learning Outcomes:	

	1	Classify and explain the production of bee products.
	2	Assess the functional properties of bee products
	3	Select the appropriate technologies for processing of functional bee products.
	4	Develop functional bee products with high added value
	5	Discuss national/international legislation about bee products
	6	Choose proper analytical techniques for the quality, assessment, authencity and adulteration of bee products
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21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	The situation of bee products production in the world and in Turkey and an overview of bee products processing technologies	
2	Honey: physico-chemical, sensory and functional properties, benefits to human health, classification, production and processing technologies	
3	Propolis and pollen: physico-chemical, sensory and functional properties, benefits to human health, classification, production and processing technologies	
4	Bee venom and royal jelly: physico-chemical, sensory and functional properties, benefits to human health, lassification, production and processing technologies	
5	Bee bread, apilarnil and beeswax: physico-chemical, sensory and functional properties, benefits to human health, classification, production and processing technologies	
6	Innovative processing technologies of bee products (freeze drying, infrared drying, microwave assisted drying, non-thermal pretreatments, extraction based on non-thermal processes, etc.)-1	
7	Innovative processing technologies of bee products (freeze drying, infrared drying, microwave assisted drying, non-thermal pretreatments, extraction based on non-thermal processes, etc.)-1	
8	Development of functional food products with high added value from bee products	
9	Factors affecting the quality of bee products	
10	Physicochemical and sensory analysis methods for the quality assessment of bee products	
11	Authencity and adulteration in bee products, spectroscopic techniques and chemometric approaches	
12	National and international legislation	
13	Project presentations	
14	Project presentations	

22	Textbooks, References and/or Other Materials:	José M. Alvarez-Suarez.2017. Bee Products - Chemical and Biological Properties, Springer. Dilek Boyacıoğlu. 2022. Bee Products and Their Applications in the Food and Pharmaceutical Industries, Elsevier Himadri panda.2017. Complete Technology Book on Honey Processing and Formulations (Harvesting, Extraction, Adulteration, Chemistry, Crystallization, Fermentation etc)., EIRI Board Journals, legislations
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	0	0.00
Quiz	0	0.00
Home work-project	1	40.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		Homework and final exam are done within the scope of this course.

24 ECTS / WORK LOAD TABLE

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	0	0.00	0.00
Homeworks	14	5.00	70.00
Projects	1	35.00	35.00
Field Studies	0	0.00	0.00
Midterm exams	0	0.00	0.00
Others	0	0.00	0.00
Final Exams	1	30.00	30.00
Total Work Load			177.00
Total work load/ 30 hr			5.90
ECTS Credit of the Course			6.00

25 CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS

	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	5	5	3	3	2	3	3	2	3	3	0	0	0	0	0	0
ÖK2	5	5	2	3	2	3	3	3	2	2	0	0	0	0	0	0

ÖK3	5	5	3	5	2	3	2	2	3	3	0	0	0	0	0	0
ÖK4	4	4	2	5	2	5	3	3	5	3	0	0	0	0	0	0
ÖK5	5	5	3	3	2	3	3	2	3	3	0	0	0	0	0	0
ÖK6	5	5	3	3	2	3	3	2	3	3	0	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**