HIGHER UNIVERSITY TECHNICIAN IN AQUACULTURE
PROJECTS SPECIALIST

COURSE SYLLABUS WITH BREAKDOWN OF THEMATIC UNITS

1. Course	**Integrative Course I**
2. Competencies	Direct the production of auxiliary organism cultured, based on the conditions evaluation of the aquaculture systems to contribute to the profitability of the organization.
3. Fourth Month Period	Second
4. Practical Hours	28
5. Theoretical Hours	2
6. Total Hours	30
7. Week Total Hours Four Month Period	2
8. Course Objective	The student demonstrate the competence of directing the production of auxiliary organism cultured, based on the evaluation of the conditions of the aquaculture systems, to contribute to the profitability of the organization.

Theme Units	Hours		
	Practical	**Theoretical**	**Total**
I. Integrative Project	6	2	8
II. Culture	14	0	1
III. Results and Conclusions	8	0	8
Total	**28**	**2**	**30**

INTEGRATIVE COURSE I

THEMATIC UNITS

1. Theme Units	**I. Integrative Project**
2. Practical Hours	6
3. Theoretical Hours	2
4. Total Hours	8
5. Objective	The student will determine the technical requirements, the methods of cultivation and farming, as well as the material and human resources required for the production of auxiliary organisms.

Themes	Learning to know	Learning to do	Learning to be
Structure of the project	Identify the structure and characteristics of the integrative project: - Name of the project - Presentation - Introduction - Basic Information: - Technical requirements of cultivation - Method of cultivation and farming: - Material and human resources required - Results - Conclusions - Bibliographic references	Elaborate the presentation and the introduction of the project.	Efficient Responsible Observer Systematic Synthesis and analysis ability
Presentation		Outline the basic information section of the project	Efficient Responsible Observer Systematic Synthesis and analysis ability

INTEGRATIVE COURSE I

Evaluation Process		
Learning outcomes	**Learning sequence**	**Instruments and type of reagents**
Based on a project of cultivation of auxiliary organisms, the student will outline the first part of the structure of the project including: - Presentation: purpose of the document. - Introduction: Mention the background of the cultivation of the species addressed in the project; naming the sections of the document - Basic information: biology of the species; and its importance in aquaculture - Regulation applicable	1. Identify the structure of the integrative project 2. Identify the theoretical framework of the Project. 3. Relate the different sections of the project such as: presentation, introduction and basic information.	Project Checklist

INTEGRATIVE COURSE I

Teaching Learning Process	
Methods and teaching techniques	**Media and didactic materials**
Project based learning Collaborative teams Research task	Computers Internet Whiteboard

Learning Space		
Classroom	**Laboratory / Workshop**	**Company**
X		

INTEGRATIVE COURSE I

THEMATIC UNITS

1. Theme Units	**II. Culture**
2. Practical Hours	14
3. Theoretical Hours	0
4. Total Hours	14
5. Objective	The student will determine the technical requirements, the methods of cultivation and farming, as well as the material and human resources required for the production of auxiliary organisms.

Themes	Learning to know	Learning to do	Learning to be
Cultivation Methods and Farming		Select the methods of cultivation and farming of auxiliary organisms.	Efficient Responsible Observer Systematic Synthesis and analysis ability
Technical Requirements		Integrate the technical requirements for the cultivation of auxiliary organisms.	Efficient Responsible Observer Systematic Synthesis and analysis ability
Material and Human Resources		Decide the requirements of material and human resources.	Efficient Responsible Observer Systematic Synthesis and analysis ability

INTEGRATIVE COURSE I

Evaluation Process		
Learning outcomes	**Learning sequence**	**Instruments and type of reagents**
Based on a project of cultivation of auxiliary organisms, the student will mention in the corresponding sections evidence of the technical information such as: - Cultivation method and farming: a) Requirements of the infrastructure and equipment. b) Procedures of the cultivation technique - Technical requirements of the cultivation under study: tolerance interval for the culture of the species to be developed: (temperature, dissolved oxygen, concentration of salts, Ph, alkalinity, hardness, light intensity), nutrients and/or feeding. - Requirements of material and humans resources: - Diagram of the production process - Job profile - System of inventory control of supplies - Work program	1. Identify the parameter and technical requirements of the cultivation of the given species. 2. Identify the cultivation method and farming of the given species. 3. Analyze the material and human resources required.	Project Checklist

INTEGRATIVE COURSE I

Teaching Learning Process	
Methods and teaching techniques	**Media and didactic materials**
Projects based learning Collaborative teams Research task	Computers Internet Whiteboard

Learning Space		
Classroom	**Laboratory / Workshop**	**Company**
X		**X**

INTEGRATIVE COURSE I

THEMATIC UNITS

1. Theme Units	**III. Results and Conclusions**
2. Practical Hours	8
3. Theoretical Hours	0
4. Total Hours	8
5. Objective	The student will present the conclusions and results of the integrative project for the validation of the methodology employed.

Theme	Learning to know	Learning to do	Learning to be
Results		Present the results of the project, supporting the results with physical or photographic evidence	Efficient Responsible Observer Systematic Synthesis and analysis ability
Conclusions		Elaborate the conclusion of the project Write the bibliographic references	Effective communicator Efficient Responsible Observer Systematic Synthesis and analysis ability

INTEGRATIVE COURSE I

Evaluation Process		
Learning outcomes	**Learning sequence**	**Instruments and type of reagents**
Based on a project of cultivation of auxiliary organisms, the student will present the final report aided with a visual presentation of results including: - Results, supported with physical and photographic evidence of the culture of the species under study. - Conclusions: - Limitations y difficulties found. - Proposal Bibliographic references	1. Analyze the results of the project. 2. Understand the structure of the final report and the presentation. 3. Analyze the limitations and the difficulties found during the development of the project. 4. Present further proposals	Project Checklist

INTEGRATIVE COURSE I

Learning teaching process	
Methods and teaching techniques	**Media and didactic materials**
Projects based learning Collaborative teams Research task	Computers Internet Whiteboard

Learning Space		
Classroom	**Laboratory / Workshop**	**Company**
X		

INTEGRATIVE COURSE I

CAPACITIES DERIVED FORM THE PROFESIONAL COMPETENCIES THAT CONTRIBUTE TO THE COURSE

Capacity	Performance Criteria
To diagnose the conditions of aquaculture systems through physicochemical and biological analysis techniques and historical records, to ensure the health, innocuousness and profitability of the production.	To prepare a report about the conditions under which an aquaculture system is found, that includes: - The steps for obtaining and processing the samples and their justification. - The analysis and interpretation of information (logs, histories, results analysis, laboratory reports). Conclusions and recommendations.
To inspect the operating conditions of the productive process through the analysis of the infrastructure, personnel and supplies, based on good management practices, to contribute to the quality of production.	Prepare an evaluation file according to the guidelines of the good practices manual for the respective species or species that includes: - The internal verification forms of good production practices duly completed - Formats of corrective recommendations for non-conformities detected - Schedule of corrections.
To schedule aquaculture system conditioning activities, the product demand and climatic conditions, to optimize resources and meet production goals.	To elaborate a program of the productive cycle based on the manual of good practices that includes: - water quality monitoring - water refills - disinfection activities of the infrastructure and the system - acquisition of supplies
To supervise the operations of production of auxiliary organisms cultured, based on the manual of good practices, the characteristics of the species, to obtain live food.	To write a production log with the following data: - species - density of organisms - physicochemical parameters of production systems - data for statistical control (date, time, number of pond, percentage of survival) - harvesting techniques - indicators of compliance with goals and interpretation - Conclusions and recommendations

INTEGRATIVE COURSE I

BIBLIOGRAPHY

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García Cantu, Alfonso	(2010)	*Almacenes: Planeación, organización y control*	México D.F.	México	Trillas
Reyes Ponce, Agustín	(20009)	*El análisis de puesto*	México D.F.	México	Limusa Noriega
Laura Torrentera Blanco Albert G.J. Tacon	(1989)	*La producción de alimento vivo y su importancia en acuacultura Una diagnosis*	Brasília	Brazil	FAO
Carlos Buxade Carbo	(1997)	*Producción animal acuática*	DF	MEXICO	Mundi-Prensa
Josianne G. Stottrup, Lesley Mcevoy	(2003)	*Live feeds in aquaculture*	Oxford	UK	Blackwell Science
James. E Graham, Lee. Wilcox		*Algae second ed.*			Barnes And Noble
Arredondo-Figueroa, J. L. et al.	(1998)	*Calidad de agua en acuacultura.*	México	México	AGT

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Moore, J. W et al.	(2000)	*El mundo de la Química: Conceptos y aplicaciones.*	México	México	Person-Prentice Hall.
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