HIGHER UNIVERSITY TECHNICIAN IN AQUACULTURE
PROJECTS SPECIALIST

COURSE SYLLABUS WITH BREAKDOWN OF THEMATIC UNITS

1. Course	**Aquaculture Systems**
2. Competencies	Direct the production of auxiliary crops, based on the evaluation of the conditions of aquaculture systems, to contribute to the profitability of the organization.
3. Four Month Period	First
4. Practical Hours	76
5. Theoretical Hours	44
6. Total Hours	120
7. Week Total Hours Four Month Period	8
8. Course objective	The student will operate the different aquaculture production systems applying techniques and criteria in the different stages of development of the species susceptible to regional exploitation.

Theme Units	Hours		
	Practical	Theoretical	Totals
I. Introduction to Aquaculture and farming methods.	0	6	6
II. Enclosure.	8	4	1
III. Reservoir.	16	8	2
IV. Suspended Systems	8	4	1
V. Floating Cages	12	6	1
VI. Circular Tanks	12	6	1
VII. Fast Flow Channels (race ways)	12	6	1
VIII. Aquaponics	8	4	1
Totals	**76**	**44**	**120**

AQUACULTURE SYSTEMS

THEMATIC UNITS

1. Theme Unit	**I. Introduction to Aquaculture and Farming Methods.**
2. Practical hours	0
3. Theoretical hours	6
4. Total Hours	6
5. Objective	The student will identify the current status and perspectives of Aquaculture in Mexico and its region, to recognize opportunities for sector development.

Themes	Learning to know	Learning to do	Learning to be
History and Development of Aquaculture	Describe the concept of Aquaculture. Identify the historical development of Aquaculture. Describe the current and prospective status of Aquaculture in Mexico.		Teamwork Proactive Organized
General Concepts of Aquaculture	Distinguish the characteristics and components of Aquaculture Farming Methods: extensive, semi-intensive, intensive and super-intensive.		Teamwork Proactive Organized

AQUACULTURE SYSTEMS

Evaluation Process		
Learning Outcomes	**Learning Sequence**	**Instruments and type of reagents**
Prepare an essay on Aquaculture in Mexico and its region, including: - Background - Current status - Prospective - State strategies to strengthen the sector. - Conclusions.	1. Identify the concept of Aquaculture. 2. Understand the historical development of Aquaculture. 3. Analyze the current and prospective status of Aquaculture in Mexico. 4. Relate the current state of Aquaculture and its prospects with its region. 5. Understand the characteristics of Aquaculture Farming Methods.	Essay Checklist

AQUACULTURE SYSTEMS

Teaching Learning Process	
Methods and teaching techniques	**Media and didactic materials**
Group discussion Collaborative Teams Research Tasks	Whiteboard Projector Computer Internet

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

WRITTEN BY: COMMITTEE OF DIRECTORS OF THE TSU CAREER IN ENGLISH EDUCATION AREA

REVISED BY: ACADEMIC AND LIAISON COMMISSION OF THE AREA

APPROVED BY: C. G. U. T.

EFFECTIVE DATE: SEPTEMBER 2010

AQUACULTURE SYSTEMS

THEME UNITS

1. Theme Unit	**II. Enclosure**
2. Practical hours	8
3. Theoretical hours	4
4. Total hours	12
5. Objective	The student will implement an aquaculture enclosure system, to cultivate aquaculture species.

Themes	Learning to know	Learning to do	Learning to be
Basic Concepts	Identify the concept and characteristics of the aquaculture enclosure system.		Honesty Efficiency Responsibility Observer Systematic Confidentiality
Requirements and Implementation of the System.	Describe the criteria and parameters of the site: regulations, water quality, depth, seasonality, accessibility, services, interactions, tributaries, orientation, climatic conditions, currents, tides, sources of impact.	Determine the appropriate site for an enclosure system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality
Infrastructure and Equipment.	Identify the characteristics of the infrastructure and equipment of the system.	Propose the infrastructure and equipment according to the selected site.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

Themes	Learning to know	Learning to do	Learning to be
Sowing, Selection and Harvesting.	Explain the methods of sowing, selecting and harvesting of the system.	Determine the method of sowing, selecting and harvesting according to the system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

AQUACULTURE SYSTEMS

Evaluation Process		
Learning Outcomes	**Learning Sequence**	**Instruments and type of reagents**
Based on a practical case, the student will propose and implement an aquaculture enclosure system and generate a technical report that includes: - Site selection and justification. - Technical specifications of infrastructure and equipment to be used and its justification. - Selection of the farming method with its justification. - Selection of the selection method with its justification. - Selection of the harvesting method with its justification. - Proposal of innovations to the system.	1. Understand the characteristics and concept of the enclosure aquaculture system. 2. Identify the criteria and parameters for site selection. 3. Understand the infrastructure and equipment characteristics of the system. 4. Understand the methods of sowing, selection and harvesting of the system. 5. Implement the enclosure aquaculture system.	Project Checklist

AQUACULTURE SYSTEMS

Teaching Learning Process	
Methods and teaching techniques	**Media and didactic materials**
Project-based learning Collaborative teams Practice in situ	Whiteboard, Projector Cannon, Computer, Internet, Rubber boots, Brushes, 19 liters buckets, Bait gloves, Meshes with different light-beam sizes, Digital and granatary balance, Manual of good practices, Spoon nets, Trawl nets, ichthyometers, Tares, Selectors, Containers, Scales, Nets, Spoons, Logs, Ice, Boat, Lamps, Knives, Filters Basic Tool Kit (mechanical) First aid kit Sampling equipment (refractometer, Secchi Disc, Oximeter, Thermometer, Turbidimeter, Potentiometer, Hygrometer, Water quality kit for fresh and salt water, Colorimeter, Spectrophotometer, Scale, Bottom dredger, and Echo sounder), Raincoat, Personal safety and protection equipment, Personal Buoys, Camera, Van-Dorn Bottle, Mosquito repellent, Sunblock, Cap.

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

AQUACULTURE SYSTEMS
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THEME UNITS

1. Theme Unit	**III. Reservoir.**
2. Practical hours	16
3. Theoretical hours	8
4. Total hours	24
5. Objective	The student will implement an aquaculture pond system, to cultivate aquaculture species.

Themes	Learning to know	Learning to do	Learning to be
Basic Concepts.	Identify the concept and characteristics of the fish pond aquaculture system. Explain the basic concepts of hydraulics: fluid dynamics, expenses, levels, flow, pressure, volume, gauge of pipes, slopes.		Honesty Efficiency Responsibility Observer Systematic Confidentiality
Requirements and Implementation of the System.	Describe the criteria and parameters of the site: good practices, regulations, water quality, depth, seasonality, accessibility, services, interactions, tributaries, orientation, climatic conditions, and sources of impact, topography and pedology of the site.	Determine the appropriate site for a pond system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

Themes	Learning to know	Learning to do	Learning to be
Infrastructure and Equipment	Identify the characteristics of the infrastructure and equipment of the system.	Propose the infrastructure and equipment according to the selected site.	Honesty Efficiency Responsibility Observer Systematic Confidentiality
Sowing, Selection and Harvesting	Explain the methods of sowing, selecting and harvesting of the system.	Determine the method of sowing, selecting and harvesting according to the system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

AQUACULTURE SYSTEMS

Evaluation Process		
Learning Outcomes	**Learning Sequence**	**Instruments and type of reagents**
Based on a case study, it will propose a fish pond aquaculture system in a model and generate a technical report that includes: - Site selection and justification. - Technical specifications of infrastructure and equipment to be used and its justification. - Selection of the farming method with its justification. - Selection of the selection method with its justification. - Selection of the harvesting method with its justification. - Proposal of innovations to the system.	1. Understand the characteristics and concept of the pond aquaculture system. 2. Identify the criteria and parameters for site selection. 3. Understand the infrastructure and equipment characteristics of the system. 4. Understand the methods of sowing, selecting and harvesting of the system. 5. Implement the fish pond aquaculture system.	Project Checklist

AQUACULTURE SYSTEMS

Teaching Learning Process	
Methods and teaching techniques	**Media and didactic materials**
Project-based learning Collaborative teams Practice in situ	Whiteboard, Projector Cannon, Internet, Computer, Hydrated lime, Iodine, Salt, Chlorine, Insecticides, Herbicides, Formaldehyde, Backpacks, Sprinklers, Rubber boots, Brushes, 19 liters buckets, Latex gloves, Bait gloves, Face masks, Meshes with different light-beam sizes, Digital and granatary balance, Creators, Logs, Manual of good practices, Diffusers, Manometer, Spoon net, Water quality kit, Hoses, Trawl nets, Dissection equipment, Ichthyometers, Tares Selectors, Containers, Scales, Spoons, Ice, Boat, Water pumps, Agitator, Oxygen tank, Diffusers, Electric generator, lamps, Knives Filters, Basic tool kit (mechanical), First aid kit Sampling equipment (Refractometer, Secchi disk, Oximeter, Thermometer, Turbidimeter, Potentiometer, Hygrometer, Water quality KIT for fresh and salt water, Colorimeter, Spectrophotometer, Scale, Bottom dredger, Echo sounder), Raincoat, Input Inventory Logs and consumables, Balanced aquaculture feedstuffs, Drugs, Personal safety and protection equipment, Camera, Feeder trays.

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

AQUACULTURE SYSTEMS

THEME UNITS

1. Theme Unit	**IV. Suspended systems**
2. Practical hours	8
3. Theoretical hours	4
4. Total Hours	12
5. Objective	The student will implement a suspended aquaculture system to cultivate aquaculture species.

Themes	Learning to know	Learning to do	Learning to be
Basic Concepts.	Identify the concept and characteristics of suspended aquaculture systems.		Honesty Efficiency Responsibility Observer Systematic Confidentiality
Requirements and Implementation of the System.	Describe the criteria parameters of site selection: good practices, regulations, water quality, depth, seasonality, accessibility, services, interactions, tributaries, orientation, climatic conditions, currents, tides, sources of impact.	Determine the appropriate site for a suspended aquaculture system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality
Infrastructure and Equipment	Identify the characteristics of the infrastructure and equipment of the system.	Propose the infrastructure and equipment according to the selected site.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

Themes	Learning to know	Learning to do	Learning to be
Sowing, Selection and Harvesting.	Explain the methods of sowing, selecting and harvesting of the system.	Determine the method of sowing, selecting and harvesting according to the system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

AQUACULTURE SYSTEMS

Evaluation Process		
Learning Outcomes	**Learning Sequence**	**Instruments and type of reagents**
Based on a case study, it will propose and implement a prototype of a suspended acquaculture system in a model and generate a technical report that includes: - Site selection and justification. - Technical specifications of infrastructure and equipment to be used and its justification. - Selection of the farming method with its justification. - Selection of the selection method with its justification. - Selection of the harvesting method with its justification. - Proposal of innovations to the system.	1. Understand the characteristics and concept of the suspended aquaculture system. 2. Identify the criteria and parameters for site selection. 3. Understand the infrastructure and equipment characteristics of the system. 4. Understand the methods of sowing, selecting and harvesting of the system. 5. Implement the suspended acquaculture system.	Project Checklist

AQUACULTURE SYSTEMS

Evaluation Process	
Methods and teaching techniques	**Media and didactic materials**
Project-based learning Collaborative teams Practice in situ	Whiteborad, Projector Cannon, Computer, Internet, Rubber boots, Brushes, 19 liters buckets, Bait gloves, Meshes with different light-beam sizes, Digital and granatary balance, Fixing substrates, Logs, Manual of good practices, Spoon net , Stereoscope, Microscopes, Instruments and laboratory equipment, Trawl Nets, Tares, Containers, Scales, Nets, Spoons, Logbook, Boat, Electric generator, Lamps, Knives, Basic tool kit (mechanical), First aid kit, Sampling equipment (Refractometer, Secchi disk, Oximeter, Thermometer, Turbidimeter, Potentiometer, Hygrometer, Water quality kit for fresh and salt water, Colorimeter, Spectrophotometer, Scale, Bottom dredger, Echo sounder), Heaters, Coolers, Raincoat, Personal safety and protection equipment, Buoys, Camera, Van-Dorn bottle, Cap, Sunscreen, Insect protector.

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

AQUACULTURE SYSTEMS

THEME UNITS

1. Theme Unit	**V. Floating cages**
2. Practical Hours	12
3. Theoretical Hours	6
4. Total Hours	18
5. Objective	The student will implement an aquaculture system of floating cages, to cultivate aquaculture species.

Themes	Learning to know	Learning to do	Learning to be
Basic Concepts.	Identify the concept and characteristics of floating cages in aquaculture systems.		Honesty Efficiency Responsibility Observer Systematic Confidentiality
Requirements and Implementation of the System.	Describe the criteria parameters of site selection: good practices, regulations, water quality, depth, seasonality, accessibility, services, interactions, tributaries, orientation, climatic conditions, currents, tides, sources of impact.	Determine the appropriate site for a floating cage system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality
Infrastructure and Equipment	Identify the characteristics of the infrastructure and equipment of the system.	Propose the infrastructure and equipment according to the selected site.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

Themes	Learning to know	Learning to do	Learning to be
Sowing, Selection and Harvesting.	Explain the methods of sowing, selecting and harvesting of the system.	Determine the method of sowing, selecting and harvesting according to the system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

AQUACULTURE SYSTEMS

Evaluation Process		
Learning Outcomes	**Learning Sequence**	**Instruments and type of reagents**
Based on a case study, it will propose an aquaculture system of floating cages in a model and generate a technical report that includes: - Site selection and justification. - Technical specifications of infrastructure and equipment to be used and its justification. - Selection of the farming method with its justification. - Selection of the selection method with its justification. - Selection of the harvesting method with its justification. - Proposal of innovations to the system.	1. Understand the characteristics and concept of the aquaculture system of floating cages. 2. Identify the criteria and parameters for site selection. 3. Understand the infrastructure and equipment characteristics of the system. 4. Understand the methods of sowing, selecting and harvesting of the system. 5. Implement the aquaculture system of floating cages.	Project Checklist

AQUACULTURE SYSTEMS

Teaching Learning Process	
Methods and teaching techniques	**Media and didactic materials**
Project-based learning Collaborative teams Practice in situ	Whiteboard, Projector Cannon, Computer, Internet, Hydrated lime, Iodine, Salt, Chlorine, Insecticides, Herbicides, Formaldehyde, Backpacks Sprinklers, Rubber boots, Brushes, 19 liters buckets, Bait gloves, Latex gloves, Face masks, Meshes with different light-beam sizes, Digital and granatary balance, Logbook, Manual of good practices, Spoon Net, Dissection equipment, Ichthyometers, Tares, Selectors, Containers, Boat, Electric generator, Lamps, Knives, Basic tool kit (mechanical), First aid kit, Sampling equipment (Refractometer, Secchi disk, Oximeter, Thermometer, Turbidimeter, Potentiometer, Hygrometer , Water quality kit for fresh and salt water, Colorimeter, Spectrophotometer, Scale, Bottom dredger, Echo sounder), Raincoat, Logbook of supplies and consumables, Balanced aquaculture foods, Drugs, Personal safety and protection equipment, Buoys, Camera and Van-Dorn bottle.

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

AQUACULTURE SYSTEMS

THEME UNITS

1. Theme Unit	**VI. Circular Tanks**
2. Practical Hours	12
3. Theoretical Hours	6
4. Total Hours	18
5. Objective	The student will implement an aquaculture system of circular tanks, to cultivate aquaculture species.

Themes	Learning to know	Learning to do	Learning to be
Basic Concepts.	Identify the concept and characteristics of circular tanks in acquaculture systems		Honesty Efficiency Responsibility Observer Systematic Confidentiality
Requirements and Implementation of the system.	Describe the criteria parameters of site selection: good practices, regulations, water quality, depth, seasonality, accessibility, services, interactions, tributaries, orientation, climatic conditions, currents, tides, sources of impact.	Determine the appropriate site for a circular tank system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality
Infrastructure and Equipment	Identify the characteristics of the infrastructure and equipment of the system.	Propose the infrastructure and equipment according to the selected site.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

Themes	Learning to know	Learning to do	Learning to be
Sowing, Selection and Harvesting.	Explain the methods of sowing, selecting and harvesting of the system.	Determine the method of sowing, selecting and harvesting according to the system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

AQUACULTURE SYSTEMS

Evaluation Process		
Learning Outcomes	**Learning Sequence**	**Instruments and type of reagents**
Based on a case study, it will propose a circular tank for an acquaculture system in a model and generate a technical report that includes: - Site selection and justification. - Technical specifications of infrastructure and equipment to be used and its justification. - Selection of the farming method with its justification. - Selection of the selection method with its justification. - Selection of the harvesting method with its justification. - Proposal of innovations to the system.	1. Understand the characteristics and concept of the circular tanks in an aquaculture system. 2. Identify the criteria and parameters for site selection. 3. Understand the infrastructure and equipment characteristics of the system. 4. Understand the methods of sowing, selecting and harvesting of the system. 5. Implement the circular tanks in an aquaculture system.	Project Checklist

AQUACULTURE SYSTEMS

Teaching Learning Process	
Methods and Teaching Techniques	**Media and didactic materials**
Project-based learning Collaborative teams Practice in situ	Whiteboard, Projector Cannon, Computer, Internet, Hydrated lime, Iodine, Salt, Chlorine, Insecticides, Herbicides, Formaldehyde, Backpacks Sprinklers, Rubber boots, Brushes, 19 liters buckets, Bait gloves, Latex gloves, Face masks, Meshes with different light-beam sizes, Digital and granatary balance, Aerators, Logbook, Manual of good practices, Diffusers, Manometer, Spoon Net, Hoses, Trawl Nets, Dissection equipment, Ichthyometers, Tares, Selectors, Containers, Scales, Spoons, Aerators, Water pumps, Agitator, Oxygen tank, Diffusers, Electric generator, Lamps, Knives, Basic Tools Kit, first aid kit, Sampling equipment (Refractometer, Secchi disc, Oximeter, Thermometer, Turbidimeter, Potentiometer, Hygrometer, Water quality kit for fresh and salt water, Colorimeter, Spectrophotometer, Scale), Heaters, Coolers, Raincoat, Personal safety and protection equipment, and Camera

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

AQUACULTURE SYSTEMS

THEME UNITS

1. Theme Unit	**VI. Fast Flow Channels (race ways)**
2. Practical Hours	12
3. Theoretical Hours	6
4. Total Hours	18
5. Objective	The student will implement an aquaculture system of fast flow channels to cultivate aquaculture species.

Themes	Learning to know	Learning to do	Learning to be
Basic Concepts.	Identify the concept and characteristics of the aquaculture system of fast flow channels (race ways).		Honesty Efficiency Responsibility Observer Systematic Confidentiality
Requirements and Implementation of the System.	Describe the criteria and parameters of site selection: good practices, regulations, water quality, seasonality, accessibility, services, interactions, tributaries, orientation, climatic conditions, and sources of impact.	Determine the appropriate site for a system of channels of rapid flow (race ways).	Honesty Efficiency Responsibility Observer Systematic Confidentiality
Infrastructure and Equipment	Identify the characteristics of the infrastructure and equipment of the system.	Propose the infrastructure and equipment according to the selected site.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

Themes	Learning to know	Learning to do	Learning to be
Sowing, Selection and Harvesting.	Explain the methods of sowing, selecting and harvesting of the system.	Determine the method of sowing, selecting and harvesting according to the system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

AQUACULTURE SYSTEMS

Evaluation Process		
Learning Outcomes	**Learning Sequence**	**Instruments and type of reagents**
Based on a case study, it will propose an aquaculture system of fast flow channels in a model and generate a technical report that includes: - Site selection and justification. - Technical specifications of infrastructure and equipment to be used and its justification. - Selection of the farming method with its justification. - Selection of the selection method with its justification. - Selection of the harvesting method with its justification. - Proposal of innovations to the system.	1. Understand the characteristics and concept of an aquaculture system of fast flow channels. 2. Identify the criteria and parameters for site selection. 3. Understand the infrastructure and equipment characteristics of the system. 4. Understand the methods of sowing, selecting and harvesting of the system. 5. Implement the fast flow channels in an aquaculture system	Project Checklist

AQUACULTURE SYSTEMS

Teaching Learning Process	
Methods and teaching techniques	**Media and didactic materials**
Project-based learning Collaborative teams Practice in situ	Whiteboard, Projector Cannon, Computer, Internet, Hydrated lime, Iodine, Salt, Chlorine, Insecticides, Herbicides, Formaldehyde, Backpacks Sprinklers, Rubber boots, Brushes, 19 liters buckets, Bait gloves, Latex gloves, Face masks, Meshes with different light-beam sizes, Digital and granatary balance, Logbook, Manual of good practices, Spoon Net, Water quality kit, Trawl Nets, Dissection equipment, Ichthyometers, Tares, Selectors, Containers, Scales, Electric generator, Lamps, Knives, Basic tool kit (mechanical), First aid kit, Sampling equipment (Refractometer, Oximeter, Thermometer, Turbidimeter, Potentiometer, Hygrometer , Water quality kit for fresh water, Colorimeter, Spectrophotometer, Scale), Raincoats, Personal safety and protection equipment and Camera.

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

AQUACULTURE SYSTEMS

THEME UNITS

1. Theme Unit	**VII. Aquaponics**
2. Practical Hours	8
3. Theoretical Hours	4
4. Total Hours	12
5. Objective	The student will implement an aquatic aquaculture system, to cultivate aquaculture species.

Themes	Learning to know	Learning to do	Learning to be
Basic Concepts.	Identify the concept and characteristics of the aquaponics aquaculture system.		Honesty Efficiency Responsibility Observer Systematic Confidentiality
Requirements and Implementation of the system.	Describe the criteria and parameters of site selection: good practices, regulations, water quality, seasonality, accessibility, services, and interactions, sources of water supply, orientation, climatic conditions, and sources of impact.	Determine the appropriate site for an aquaponics system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality
Infrastructure and Equipment	Identify the characteristics of the infrastructure and equipment of the system.	Propose the infrastructure and equipment according to the selected site.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

Themes	Learning to know	Learning to do	Learning to be
Sowing, Selection and Harvesting.	Explain the methods of sowing, selecting and harvesting of the system.	Determine the method of sowing, selecting and harvesting according to the system.	Honesty Efficiency Responsibility Observer Systematic Confidentiality

AQUACULTURE SYSTEMS

Evaluation Process		
Learning Outcomes	**Learning Sequence**	**Instruments and type of reagents**
Based on a case study, it will propose an aquatic aquaculture system in a model and generate a technical report that includes: - Site selection and justification. - Technical specifications of infrastructure and equipment to be used and its justification. - Selection of the farming method with its justification. - Selection of the selection method with its justification. - Selection of the harvesting method with its justification. - Proposal of innovations to the system.	1. Understand the characteristics and concept of an aquatic aquaculture system. 2. Identify the criteria and parameters for site selection. 3. Understand the infrastructure and equipment characteristics of the system. 4. Understand the methods of sowing, selecting and harvesting of the system. 5. Implement an aquatic aquaculture system.	Project Checklist

AQUACULTURE SYSTEMS

Teaching Learning Process	
Methods and teaching techniques	**Media and didactic materials**
Project-based learning Collaborative teams Practice in situ	Whiteboard, Projector cannon, Computer, Internet, Hydrated lime, Iodine, Salt, Chlorine, Insecticides, Herbicides, Formaldehyde, Backpacks, Sprinklers, Rubber boots, Brushes, 19 liters buckets, Bait gloves, Latex gloves, Face masks, Meshes with different light-beam sizes, Digital and granatary balance, Aerators, Fixing substrates, Logbook, Manual of good practices,Difussers, Manometer, Spoon Net, Water quality kit, Stereoscope, Microscopes, Instruments and laboratory equipment, Trawl Nets, Tares Selectors, Containers, Aerators, Water pumps, Agitator, Oxygen tank, Electric generator, Lamps, Knives, Filters, Basic tool kit (mechanical), First aid kit, Sampling equipment (Refractometer, Oximeter, Thermometer, Potentiometer, Water quality KIT for fresh water, Colorimeter), Heaters, Coolers, Raincoat, Logbook of supplies and consumables, Balanced aquaculture foods, Drugs, Personal safety and protection equipment and Camera.

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

AQUACULTURE SYSTEMS

CAPACITIES DERIVED FROM THE PROFESSIONAL COMPETENCES TO WHICH THE COURSE CONTRIBUTES

Capacity	Performance Criteria
Diagnose the conditions of aquaculture systems. Through physicochemical and biological analysis techniques and historical records, to guarantee the health, safety and profitability of production.	Prepare a report on the conditions under which an aquaculture system is found, containing: - Obtaining and processing the samples and their justification. - Analysis and interpretation of information (logs, histories, analysis results, 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.
Schedule aquaculture system conditioning activities, product demand and climatic conditions, to optimize resources and meet production goals.	Elaborate a program of the productive cycle based on the manual of good practices and that contains: - water quality monitoring - water refills - disinfection activities of the infrastructure and the system - acquisition of supplies

Capacity	Performance Criteria
Supervise the operations of production of auxiliary crops based on the manual of good practices, the characteristics of the species, to obtain live food.	Integrate 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.

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LR Martínez C	(1998)	*Ecología de los sistemas acuícolas*	México D.F.	México	AGT
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Cuenco, M.L.	(1989)	*Aquaculture systems modeling: and introduction with enphasis on warm wather aquaculture*	Manila	Filipinas	ICLARM studies and reviews
SAGARPA SENASICA		*Manuales de buenas practicas*	http://www.senasica.gob.mx/?id=1642		