45 to 60 credits

Aquarium Science Certificate

Enter course information in light yellow areas (totals will be automatically calculated)

Subject Code	Course Number	Course Title	Credits	Hours	Related instruction Hours in: Computation	Communication	Human Relation	Total RI
BKT	*101*	*Basket Weaving Basics*	*4*	*120*	*6*	*12*	*8*	***26***
courses used for embedded related instruction				0				*No RI*
AQS	100	Introduction to Aquarium Science	3	90	8.00	8.00	12.00	***28.00***
AQS	232	Reproduction and Nutrition of Aquatic A	4	120	12.00	4.00	12.00	***28.00***
AQS	240	Life Support Design and Operation	4	120	18.00	6.00	12.00	***36.00***
AQS	252	Exhibits and Interpretation	4	120		24.00	24.00	***48.00***
AQS	270	Fish and Invertebrate Health Managem	4	120	12.00	8.00		***20.00***
				0				*No RI*
				0				*No RI*
				0				*No RI*
courses used for stand-alone related instruction				0				*No RI*
				0				*No RI*
				0				*No RI*
				0				*No RI*
		Totals	**19**	**570**	**50.00**	**50.00**	**60.00**	**160.00**
		Minimum for 1 yr certificate:			48.00	48.00	48.00	**144.00**
		Remaining to meet Min. Requirement:			0.00	0.00	0.00	0.00

	YES	NO
All courses identified as embedded related instruction are approved by the curriculum committee for RI?		
Related instruction instructor qualification forms are filed with the VP Academic & Student Affairs?		

If you answered no to either statement visit the related instruction website to find details about these requirements.

Related Instruction Overview | PCC

for assistance contact: sally.earll@pcc.edu or 971.722.7812

Related Instruction for CTE Courses

Save this document as the course prefix and number

Send completed form electronically to curriculum@pcc.edu

General Information			
Department:	Aquarium Science	Submitter:	Chris Spaulding
Prefix and Course Number:	AQS 100	Submitter Phone and Email:	541-867-8678 Chris.spaulding@occc.cc.or.us
Credit	3	Course Title:	Introduction to Aquarium Science

Details of Related Instruction guidelines for identifying related instruction

Identify the number of hours and the course activities in the areas of:

1) computation, 2) communication and 3) human relations.

Please be as specific as possible about the nature of the activities and instruction

A result of the NWCCU report is that related instruction must be identified within a course outcome.

Computation	Hours of instruction (include study and/or practice in and out of the classroom, 30 hours per credit)	8 hours

Course Outcome: Copy from the CCOG the outcome(s) which is associated with computation.

- Assess the physical, chemical and biological processes occurring in the aquatic environment.
- Properly use associated tools and equipment.
- Create and maintain suitable aquatic habitats.

Content (Activities, Skills, Concepts, etc.): provide details or specifics

- Data collection and interpretation of results for aquarium systems.
- Calculate the water volume of a closed prism and cylinder given area measurements
- Convert water quality parameters and water conditioning additives between various units (i.e. mg, ml, gallons, liters, and cubic inches)

Communication	Hours of instruction (include study and/or practice in and out of the classroom 30 hours per credit)	8 hours

Course Outcome: Copy from the CCOG the outcome(s) which is associated with communication.

- Assess the physical, chemical and biological processes occurring in the aquatic environment.
- Properly use associated tools and equipment
- Identify employment venues and information resources.

Content (Activities, Skills, Concepts, etc.): provide details or specifics

- Oral presentation project utilizing information resources for a select aquatic species (fish or invertebrate) for display, research or aquaculture within the aquarium industry.
- Identify and communicate information resources available within the aquarium industry.

- Application and use of terminology for aquarium equipment, tools, materials and products and how these items are used on aquarium systems.
- Record keeping and communication of water quality/conditioning, animal care and observation.
- Communicate a safe working environment and operate equipment in a safe manner.
- Resume building for a career in aquarium science.
- Effective communication and coordination of husbandry schedules and practices with team member(s).
- Networking with professionals, vendors and suppliers to acquire information, supplies, products and services in the aquarium science industry.

Human Relations	Hours of instruction (include study and/or practice in and out of the classroom 30 hours per credit)	12 hours

Course Outcome: Copy from the CCOG the outcome(s) which is associated with human relations.

- Create and maintain suitable aquatic habitats.
- Properly use associated tools and equipment.
- Identify employment venues and information resources.

Content (Activities, Skills, Concepts, etc.): provide details or specifics

- Set-up, establishment and maintenance of a living aquarium system with partner
- Network with aquarium professionals to learn about career opportunities in aquarium science related organizations
- The application of aquariums as public displays for communicating conservation and educational messaging.(public aquariums and zoos)
- Communicate a safe working environment and operate equipment within a team.
- Resume building for a career in aquarium science.
- Effective communication and coordination of husbandry schedules and practices with team member(s).

This request will remain in pending status until the hard copy, with appropriate signatures, is received by the curriculum office. Missing Information may cause the request to be returned.

After submitting this form, a confirmation and signature page will be sent to DC – 4th floor.

Instructor Qualifications

This section is to be reviewed and approved by the Vice President of Academic and Student Affairs. Curriculum Committee recommendation is not required.

Instructors qualified to teach related instruction in **computation, communication, and/or human relations** will have the following acceptable subject area skills, education or training. Provide details

Identify area(s) of related instruction	Clearly identify qualifications instructors must have to teach EACH area as identified above

☐ Computation	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background and experience working in related field of the aquarium science industry with the ability to: • Calculate and prescribe appropriate dosages for aquarium water conditioners, supplements and additives • Calculate system water volumes • Prepare and test water quality parameters using related equipment • Evaluate water quality results • Formulate and deliver effective data collection for aquarium system care.
☐ Communication	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background and experience working in related field of the aquarium science industry with the ability to: • Understand and explain resource information used in the aquarium industry and related fields • Develop and evaluate effective record keeping for aquarium systems • Practice and communicate safe working practices for laboratory and aquarium husbandry spaces, equipment and materials • Manage aquarium husbandry related tasks and teams. • Instruct and evaluate research topics and oral presentation techniques.
☐ Human Relations	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background and experience working in related field of the aquarium science industry with the ability to: • Understand and communicate criteria for employee selection into careers in aquarium science. • Evaluate and help construct effective resumes for individuals seeking employment in aquarium science. • Effectively manage husbandry related tasks and teams

Related Instruction for CTE Courses

Save this document as the course prefix and number

Send completed form electronically to curriculum@pcc.edu

General Information			
Department:	Aquarium Science	Submitter:	Chris Spaulding
Prefix and Course Number:	AQS 232	Submitter Phone and Email:	541-867-8678 Chris.spaulding@occc.cc.or.us
Credit	4	Course Title:	Reproduction and Nutrition of Aquatic Animals

Details of Related Instruction guidelines for identifying related instruction

Identify the number of hours and the course activities in the areas of:

1) computation, 2) communication and 3) human relations.

Please be as specific as possible about the nature of the activities and instruction

A result of the NWCCU report is that related instruction must be identified within a course outcome.

Computation	Hours of instruction (include study and/or practice in and out of the classroom, 30 hours per credit)	12 hours

Course Outcome: Copy from the CCOG the outcome(s) which is associated with computation.

- Formulate a suitable dietary and feeding program for aquatic animals.

Content (Activities, Skills, Concepts, etc.): provide details or specifics

- Measure and dose trace elements and vitamins for aquatic animal diets.
- Measure binders, stimulants and coloring agents and their function and add into formulated diets.
- Economic and practical concerns of diet selection/formulation.
- Calculation of food conversion ratio (FCR)
- Formulate and produce gel diet.

Communication	Hours of instruction (include study and/or practice in and out of the classroom 30 hours per credit)	4 hours

Course Outcome: Copy from the CCOG the outcome(s) which is associated with communication.

- Identify common reproductive strategies of selected fishes and invertebrates.
- Apply rearing techniques for the care of offspring of commonly cultured fishes and invertebrates.

Content (Activities, Skills, Concepts, etc.): provide details or specifics

- Oral presentation on the development of a nutritional and reproductive based hypotheses and research project and communication of results.
- Read and understand feed ingredients on food packaging and data sheets used for raising aquatic animals.
- Conduct and communicate culture and feeding techniques for live prey, larval fish, and/or other aquatic organisms.

Human Relations	Hours of instruction (include study and/or practice in and out of the classroom 30 hours per credit)	12 hours

Course Outcome: Copy from the CCOG the outcome(s) which is associated with human relations.

- Construct an environmental protocol to induce gamete maturation in commonly cultured fishes and invertebrates.
- Apply rearing techniques for the care of offspring of commonly cultured fishes and invertebrates.

Content (Activities, Skills, Concepts, etc.): provide details or specifics

- Laboratory activities require students the opportunity to work in teams to produce artificial fish food, culture and evaluate live prey and employ these techniques for rearing larval and adult fish or other aquatic organisms.
- Team-based activities and team term project that allow students to think critically, develop nutritional and reproductive based hypothesis and protocol to induce gamete maturation.

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Instructor Qualifications

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Instructors qualified to teach related instruction in **computation, communication, and/or human relations** will have the following acceptable subject area skills, education or training. Provide details

Identify area(s) of related instruction	Clearly identify qualifications instructors must have to teach EACH area as identified above
☐ Computation	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background, academic knowledge and/or work-related experience in the field of aquarium science and/or applied research in aquatic animal nutrition with the ability to: • Explain and demonstrate the calculation of energetics, macronutrients, and micronutrients as applied to aquatic nutrition • Explain appropriate feed production and feeding amounts for aquatic animal nutrition and reproduction. • Discuss economic concerns of diet selection and formulation • Formulate and produce diets for aquatic specimens • Calculate food conversion ratios (FRC)
☐ Communication	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background, academic knowledge and/or work-related experience in the field of aquarium science and/or applied research in aquatic animal nutrition with the ability to: • Assess oral presentations and research techniques related to aquatic animal nutrition and reproduction • Deliver content and explain effective communication of content outlined in the Course Content and Outline Guide for the course.

☐ Human Relations	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background, academic knowledge and/or work-related experience in the field of aquarium science and/or applied research in aquatic animal nutrition with the ability to: • Manage team based research projects and laboratory activities which require interpersonal skills and conflict resolution.

Related Instruction for CTE Courses

Save this document as the course prefix and number

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General Information			
Department:	Aquarium Science	Submitter:	Chris Spaulding
Prefix and Course Number:	AQS 240	Submitter Phone and Email:	541-867-8678 Chris.spaulding@occc.cc.or.us
Credit	4	Course Title:	Life Support System Design and Operation

Details of Related Instruction guidelines for identifying related instruction

Identify the number of hours and the course activities in the areas of:

1) computation, 2) communication and 3) human relations.

Please be as specific as possible about the nature of the activities and instruction

A result of the NWCCU report is that related instruction must be identified within a course outcome.

Computation	Hours of instruction (include study and/or practice in and out of the classroom, 30 hours per credit)	18 hours

Course Outcome: Copy from the CCOG the outcome(s) which is associated with computation.

- Select water quality parameters impacted by life support systems and relate the use of associated equipment to evaluate aquatic environments.
- Size and select appropriate life support system components and equipment for an aquatic system.
- Design and build an aquatic life support system.

Content (Activities, Skills, Concepts, etc.): provide details or specifics

- Measurements related to the construction and installation of a physical life support system.
- Lab assignments, quizzes and exams with computation using applied mathematics
- Principles of fluid dynamics and the role of pressure and energy within pumping systems for life support.
- Identify costs for a life support system and its components.
- Calculate system volumes, flow rates, total dynamic head and turnover of a life support system.
- Read and interpret performance curves for selecting pumps.
- Calculate and select properly sized biological filters and media surface area using bio-load and total ammonia-nitrogen.

Communication	Hours of instruction (include study and/or practice in and out of the classroom 30 hours per credit)	6 hours

Course Outcome: Copy from the CCOG the outcome(s) which is associated with communication.

- Size and select appropriate life support system components and equipment for an aquatic system.
- Trouble-shoot and remedy faulty life support system components.
- Design and build an aquatic life support system.

Content (Activities, Skills, Concepts, etc.): provide details or specifics
• Written team term project with oral presentation utilizing role playing and information resources for the planning and design of a theoretical life support system for an exhibit, aquaculture or research application. • Communication of safe practices when working with life support tools, equipment and materials. • Communicating with members of a team to accomplish a common goal from distinct individual roles. • Identification and use of correct terminology for life support systems and their components. • Map and trace direction of water flow through a life support system and its components. • Read, interpret and create basic life support schematics (P&IDs, floor plans and elevations). • Read and interpret performance curves for selecting pumps.

Human Relations	Hours of instruction (include study and/or practice in and out of the classroom 30 hours per credit)	12 hours
Course Outcome: Copy from the CCOG the outcome(s) which is associated with human relations.		
• Size and select appropriate life support system components and equipment for an aquatic system. • Design and build an aquatic life support system.		
Content (Activities, Skills, Concepts, etc.): provide details or specifics		
• Team term project utilizing role playing and information resources for the planning and design of a theoretical life support system for an exhibit, aquaculture or research application. • Exploration of team dynamics, roles and project goals for life support projects. • Working with members of a team to accomplish a common goal from distinct individual roles.		
This request will remain in pending status until the hard copy, with appropriate signatures, is received by the curriculum office. Missing Information may cause the request to be returned.		
After submitting this form, a confirmation and signature page will be sent to DC – 4th floor.		

Instructor Qualifications	
This section is to be reviewed and approved by the Vice President of Academic and Student Affairs. Curriculum Committee recommendation is not required.	
Instructors qualified to teach related instruction in **computation, communication, and/or human relations** will have the following acceptable subject area skills, education or training. Provide details	
Identify area(s) of related instruction	Clearly identify qualifications instructors must have to teach EACH area as identified above
☐ Computation	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background, academic knowledge and/or work-related experience in life support system related design and operations with the ability to: • Operate tools used for life support system construction and apply dimensional and spatial computation to common construction materials. • Understand and explain energy in pumping systems and how to calculate pressure head, total dynamic head, and friction loss. • Convert and calculate common volumetric measurements.

	• Convert and calculate common fluid dynamic measurements and values such as flow rate and turnover rates. • Calculate total available nitrogen (TAN) in an aquatic system. • Size and select appropriate biological filter parameters by calculating the surface area to volume for a given biological load. • Understand, interpret and explain the use of life support design tools such as schematics, isometrics, layouts, elevations, and P&IDs. • Size and select appropriate plumbing parts and fitting for life support installation.
☐ Communication	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background, academic knowledge and/or work-related experience in life support system design and operations with the ability to: • Understand and explain the safe use of life support equipment and related tools through proper communication and techniques • Identify common and select sources of information and supplies used within the life support industry • Give examples and explain record keeping and data collection techniques/tools used in life support systems.
☐ Human Relations	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background, academic knowledge and/or work-related experience in life support system design and operations with the ability to: • Establish the framework for team dynamics in group projects emphasizing life support system safety, communication and role responsibility. • Facilitate and manage life support operator teams.

Related Instruction for CTE Courses

Save this document as the course prefix and number

Send completed form electronically to curriculum@pcc.edu

General Information			
Department:	Aquarium Science	Submitter:	Chris Spaulding
Prefix and Course Number:	AQS 252	Submitter Phone and Email:	541-867-8678 Chris.spaulding@occc.cc.or.us
Credit	4	Course Title:	Exhibits and Interpretation

Details of Related Instruction guidelines for identifying related instruction

Identify the number of hours and the course activities in the areas of:

1) computation, 2) communication and 3) human relations.

Please be as specific as possible about the nature of the activities and instruction

A result of the NWCCU report is that related instruction must be identified within a course outcome.

Computation	Hours of instruction (include study and/or practice in and out of the classroom, 30 hours per credit)	0 hours
Course Outcome: Copy from the CCOG the outcome(s) which is associated with computation.		
Content (Activities, Skills, Concepts, etc.): provide details or specifics		

Communication	Hours of instruction (include study and/or practice in and out of the classroom 30 hours per credit)	24 hours
Course Outcome: Copy from the CCOG the outcome(s) which is associated with communication.		

- Serve as a contributing member of an exhibit planning team, supporting the process of creating an exhibit and the roles of others on the team.
- Apply the principles of interpretation to the programs that husbandry staff are frequently asked to perform.
- Write effective interpretive material for exhibits, newsletters, and brochures.
- Describe what makes an effective exhibit, and evaluate exhibits and interpretation using industry standard criteria.
- Apply industry related information resources to the design and development of aquarium exhibits and interpretation.

Content (Activities, Skills, Concepts, etc.): provide details or specifics

- Participation in classroom activities and discussions that utilize exhibit development tools and techniques.
- Team term project communicating information resources and tools for the development and design of a theoretical aquarium exhibit which includes the creation of a three dimensional scale model of the proposed exhibit concept.

- Delivery of a public oral interpretive presentation on an exhibit topic related to the term project.
- Team dynamics including the roles and responsibilities of the exhibit design and development team.
- Role of animal husbandry staff in exhibit design teams.
- Development of concepts, themes, messages, objectives, narratives and evaluations for exhibits and interpretive programs.
- Exploration of learning styles and special needs in formal and informal education settings within public aquariums, zoos, nature centers and museums.
- Principles and techniques of connecting an audience with exhibits through motivation, provocation, interaction and interpretive programming.
- Communicate, coordinate and work as an effective member of an exhibit design team.
- Develop a concept statement for an aquarium exhibit idea.
- Create a component script and narrative for a proposed aquarium exhibit.
- Identify ways to reach diverse audiences with various learning styles, preferences and needs.
- Generate and deliver an interpretive outline for an aquarium exhibit to a public audience.
- Use of facts, interactivity, objects, voice and body language as techniques in delivering interpretation.
- Participate in exhibit planning meetings and record minutes.
- Develop tools for evaluating aquarium exhibits and communicating results.

Human Relations	Hours of instruction (include study and/or practice in and out of the classroom 30 hours per credit)	24 hours

Course Outcome: Copy from the CCOG the outcome(s) which is associated with human relations.

- Serve as a contributing member of an exhibit planning team, supporting the process of creating an exhibit and the roles of others on the team.
- Apply the principles of interpretation to the programs that husbandry staff are frequently asked to perform.
- Write effective interpretive material for exhibits, newsletters, and brochures.

Content (Activities, Skills, Concepts, etc.): provide details or specifics

- Participation in classroom activities and discussions that utilize exhibit development tools and techniques.
- Team term project utilizing information resources and tools for the development and design of a theoretical aquarium exhibit which includes the creation of a three dimensional scale model of the proposed exhibit concept.
- Exploration of team dynamics including the roles and responsibilities of the exhibit design and development team.
- Role of animal husbandry staff in the exhibit and interpretation design and development process within exhibit design teams.
- Exploration of learning styles and special needs in formal and informal education settings within public aquariums, zoos, nature centers and museums.
- Principles and techniques of connecting an audience with exhibits through motivation, provocation, interaction and interpretive programming.
- Working with members of a team to accomplish a common goal from distinct individual roles.
- Meeting special needs and requirements for diverse audiences.
- Communicate, coordinate and work as an effective member of an exhibit design team.
- Identify ways to reach diverse audiences with various learning styles, preferences and needs.

- Generate and deliver an interpretive outline for an aquarium exhibit to a public audience.
- Use of facts, interactivity, objects, voice and body language as techniques in delivering interpretation.
- Participate in exhibit planning meetings and record minutes.

This request will remain in pending status until the hard copy, with appropriate signatures, is received by the curriculum office. Missing Information may cause the request to be returned.

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Instructor Qualifications

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Instructors qualified to teach related instruction in **computation, communication, and/or human relations** will have the following acceptable subject area skills, education or training. Provide details

Identify area(s) of related instruction	Clearly identify qualifications instructors must have to teach EACH area as identified above
☐ Computation	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background, academic knowledge and/or work-related experience in exhibit design and interpretive program development with the ability to: • Understand and explain the cost of exhibit design related to the selection of components and materials commonly used. • Develop and explain budgets for exhibit projects and interpretive programs.
☐ Communication	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background, academic knowledge and/or work-related experience in exhibit design and interpretive program development with the ability to: • Establish and facilitate effective exhibit development and project teams • Explain the use and development of tools, concepts, themes and messaging in exhibits and interpretation for audience communication. • Understand and explain interpretive techniques used in exhibits • Set-up and explain how to effectively utilize team meetings.
☐ Human Relations	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background, academic knowledge and/or work-related experience in exhibit design and interpretive program development with the ability to: • Establish and facilitate effective exhibit development and project teams using project management and goal delivery tools. • Understand and explain the roles and expectations for effective project management and teams. • Understand and articulate the needs and learning styles of diverse audiences and the effective ways of reaching them through exhibits and interpretation techniques. • Explain and deliver ways to inspire and provoke visitors through exhibits and interpretation.

Related Instruction for CTE Courses

Save this document as the course prefix and number

Send completed form electronically to curriculum@pcc.edu

General Information			
Department:	Aquarium Science	Submitter:	Chris Spaulding
Prefix and Course Number:	AQS 270	Submitter Phone and Email:	541-867-8678 Chris.spaulding@occc.cc.or.us
Credit	4	Course Title:	Fish and Invertebrate Health Management

Details of Related Instruction guidelines for identifying related instruction

Identify the number of hours and the course activities in the areas of:

1) computation, 2) communication and 3) human relations.

Please be as specific as possible about the nature of the activities and instruction

A result of the NWCCU report is that related instruction must be identified within a course outcome.

Computation	Hours of instruction (include study and/or practice in and out of the classroom, 30 hours per credit)	12 hours

Course Outcome: Copy from the CCOG the outcome(s) which is associated with computation.

- Demonstrate proper use and maintenance of laboratory instrumentation.
- Formulate a health management plan based upon the results of diagnostic testing and professional consultation.
- Perform common treatment methodologies.

Content (Activities, Skills, Concepts, etc.): provide details or specifics

- Calculate the proper dose for treatment and disease management for aquarium species within the following:
  - Waterborne treatments
  - Oral treatment strategies
  - Injectable treatments
- Calculate the proper dose for sedation and euthanasia of common fish and invertebrate species.
- Measure and interpret common diagnostic laboratory findings and water quality results to identify the probable cause(s) of a fish or invertebrate health problem.
- Calculate system volumes and common drug dosages and durations for commonly used drugs and chemicals.

Communication	Hours of instruction (include study and/or practice in and out of the classroom 30 hours per credit)	8 hours

Course Outcome: Copy from the CCOG the outcome(s) which is associated with communication.

- Describe the common infectious and non-infectious diseases associated with captive aquarium fish.
- Formulate a health management plan based upon the results of diagnostic testing and professional consultation.

Content (Activities, Skills, Concepts, etc.): provide details or specifics

• Term project utilizing written information and resources to develop a biosecurity plan for a selected animal holding facility.
• Case–based problem solving activities with partners that utilize skills and knowledge to identify health and animal holding system problems and develop treatment and management strategies.
• Writing assignments that utilize the knowledge and skills of fish and invertebrate health management to communicate common diseases, management and husbandry practices to professional colleagues.
• Discussion of merging issues on fish and invertebrate welfare and health management
  ○ Pain perception and assessment on fish and invertebrates
  ○ Assessment of fish and invertebrate welfare
  ○ How sensory stimuli affect fish and invertebrate health
• Working as a member of a health management team.
• Read and interpret common diagnostic laboratory findings and water quality results to identify the probable cause(s) of a fish or invertebrate health problem.
• Consultation with professional veterinarians for determination of appropriate responses to animal health issues.
• Develop a treatment and management protocol based upon facility/system history, animal behavior, diagnostic findings, water quality results and veterinary consultation.
• Communicate and coordinate the development of a biosecurity plan with other members of the project team.
• Work as a member of a team to develop preventive health management strategies and a response to a disease outbreak.

Human Relations	Hours of instruction (include study and/or practice in and out of the classroom 30 hours per credit)	0 hours
Course Outcome: Copy from the CCOG the outcome(s) which is associated with human relations.		
Content (Activities, Skills, Concepts, etc.): provide details or specifics		
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Instructor Qualifications	
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Instructors qualified to teach related instruction in **computation, communication, and/or human relations** will have the following acceptable subject area skills, education or training. Provide details	
Identify area(s) of related instruction	Clearly identify qualifications instructors must have to teach EACH area as identified above
☐ Computation	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background, academic knowledge and/or work-related experience in

	aquatic animal health management with the ability to: • Calculate treatment dosages for medications administered for common fish and invertebrate ailments. • Convert common units associated with medical dosages for common fish and invertebrate diseases. • Calculate system water volumes for various aquarium dimensions. • Calibrate and use common water quality laboratory equipment for testing water parameters in aquariums.
☐ Communication	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background, academic knowledge and/or work-related experience in aquatic animal health management with the ability to: • Diagnose common fish disease and ailments and administer proper treatment regimes. • Understand and develop animal health management plans for aquatic species. • Develop and administer biosecurity plan for aquatic animal care facilities. • Manage and consult on issues related to animal health care units and their operations. • Integrate common and standard animal health care practices within the aquatic animal care industry to teams administering husbandry. • Develop and deliver proper record keeping and data collection techniques for animal health management.
☐ Human Relations	B.S. Life Science and five years experience in the aquarium science industry. Demonstrated background, academic knowledge and/or work-related experience in aquatic animal health management with the ability to: • Understand and explain the interfaces between an aquatic animal care team with regulatory agencies, consulting veterinarians and external animal welfare groups. • Associate animal health management techniques with the safety needs and requirements of animal care professionals • Facilitate team dynamics and communication within an aquatic animal care team with regard to animal health issues.