

# APPLIED COASTAL ECOLOGY (ACE)

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## ACE 045 45hrs 1XX Elect Cr ACE prefix

0 Credits

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## ACE 090 90hrs Elect Cred ACE prefix

0 Credits

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## ACE 100 Outdoor Safety and Certification

4 Credits

### Prerequisites

take 1 ACE course

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## ACE 101 Applied Service Learning

2 Credits

One of the cornerstones of the ACE program is that its graduates are able to effectively and cooperatively work with a broad range of people, applying their learning and skills to the growth, development, enhancement and preservation of their communities. In this course, students will be required to participate in team building, professional networking and related community volunteer service activities.

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## ACE 102 Traditional Ecological Knowledge

2 Credits

### Prerequisites

English Studies 10, English First Peoples 10 or equivalent

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## ACE 104 Bear Education and Safety

1 Credit

Students will be introduced to the life history, behaviour and ecology of black bears and grizzly bears in the coastal environment. Students will learn how to reduce their risks when working or recreating in bear country and acquire the knowledge and skills to know how to avoid bear/human conflicts. This course will enable students to assess the risks and take the appropriate action when they encounter a bear in the wild.

### Prerequisites

English Studies 10, English First Peoples 10 or equivalent and Foundations of Math 10 or equivalent

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## ACE 106 Shorekeepers: Monitoring Intertidal Habitat

1 Credit

Students will be introduced to the methodologies of monitoring intertidal zone habitats. Physical substrate characteristics and biological features will be used to define and map the intertidal zone. Students will learn to identify plant and animal species found in the intertidal zone and determine species diversity and abundance.

### Prerequisites

English Studies 10, English First Peoples 10 or equivalent and Foundations of Math 10 or equivalent

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## ACE 120 Fisheries Management and Regulations

1 Credit

### Prerequisites

English Studies 11, English First Peoples 11 or equivalent

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## ACE 121 Fisheries Management & Coastal Policy

1 Credit

This course focuses on the management, regulation and enforcement of the fishing industry by Federal/Provincial/Territorial and First Nations governing bodies, as well as a range of global to local marine and coastal policy and planning issues. Topics include the management of regulated fish and mammal species in BC including tidal/non-tidal, fishing boundaries, openings and closures, acts & regulations and the general legal context within which the natural resources of the coast are managed. This course would be useful for both those entering technology level positions and those aiming for managerial positions.

### Prerequisites

English Studies 11, English First Peoples 11 or equivalent

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)



**ACE 122 Marine and Coastal Policy and Planning**

1 Credit

This course will cover a range of global to local marine and coastal policy and planning issues. It will help students understand the legal context within which the natural resources of the coast are managed. This course would be useful for both those entering technology level positions and those aiming for managerial positions.

**Prerequisites**

English Studies 11, English First Peoples 11 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 126 Conflict Resolution**

1 Credit

**Prerequisites**

English Studies 11, English First Peoples 11 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 130 Shellfish ID and Enumeration**

1 Credit

This course focuses on the identification of shellfish (mollusks, crustaceans and echinoderms) species commonly found on the northwest coast of BC.

Topics include the identification, enumeration methods, life cycles of shellfish and assessment of their habitat.

**Prerequisites**

English Studies 10, English First Peoples 10 or equivalent and Principles of Math 10 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 132 ID of Groundfish and other non- Salmonid Fishes of the Northwest Pacific**

1 Credit

This course focuses on the identification of groundfish, herring, oolichan and other non-salmonid species commonly found on the northwest coast of BC. Topics include the identification, enumeration methods and life cycles of the aforementioned fish species. Habitat requirements, the basics of management strategies and the principles of commercial fishing methods will be explained. One or two fisheries will be observed.

**Prerequisites**

English Studies 10, English Peoples 10 or equivalent and Principles of Math 10 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 134 Fishes of the Pacific Northwest Rearing**

3 Credits

This course will introduce students to the ecology, physiology, life cycles, migration characteristics, identification traits, fisheries and management practices for key fish species that are harvested in commercial, recreational and Aboriginal fisheries in Northwest British Columbia, with particular emphasis on the different species of Pacific salmon. This course will outline key identifying characteristics of salmon, trout and key non-salmonid species, including groundfish, Pacific herring, and eulachon. This course will cover in-field enumeration and biological sampling techniques for salmon and other fish species. During the field component of this course, students will observe and participate in fisheries research projects coordinated by local conservation, government and First Nations organizations.

**Prerequisites**

ENGL 10 or ENGL 030 and Principles of Math 10, Precalculus 10 or MATH 0301/0302

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 140 Estimating Aquatic Populations**

1.5 Credits

Students will be introduced to the techniques and methodologies relevant to the estimation of aquatic animal populations. Topics will include: methods of counting and capturing aquatic animals for study, tagging equipment technologies, removal and recapturing methods for estimating populations and passive quadrat sampling.

**Prerequisites**

English Studies 11, English First Peoples 11 or equivalent and PreCalculus 11 or ACE 150

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 141 Monitoring & Measuring Aquatic and Intertidal Zone Habitats**

2 Credits

Students will be introduced to the techniques and methodologies relevant to the estimation of aquatic animal populations. Topics will include: methods of counting and capturing aquatic animals for study, tagging equipment technologies, removal and recapturing methods for estimating populations and passive quadrat sampling. Students will also be introduced to the methodologies of monitoring intertidal zone habitats. Physical substrate characteristics and biological features will be used to define and map the intertidal zone.

**Prerequisites**

English 11 and Principles of Math 11 or PreCalculus 11

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)



**ACE 142 Coastal Forest Measurements**

2 Credits

This course introduces natural resources and data collection skills used to monitor and assess the health and vigor of coastal forests. Students will learn the methodologies of forest resource inventories and understand the importance of sustained yield and integrated resource management. Students will conduct silviculture plantability and free to grow surveys that assess the fulfillment of reforestation obligations.

**Prerequisites**

English 11 or equivalent and Math 11

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 150 Applied Technical Math**

3 Credits

The purpose of this course is to equip students with the practical mathematical skills used in the resource technology field. Students will learn to apply mathematics to situations and problems that arise in the everyday activities of a resources technologist.

**Prerequisites**

Take MA-11

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 152 Map and Aerial Photo Interpretation**

2 Credits

this course introduces the student to basic drafting techniques and mapping skills including map ready, air phot interpretation, the use of marine charts and course plotting. Topics covered include reading and interpreting forest cover and other land-based maps, stereoscopic viewing and interpretation of air photos and marine charts and nautical measurements.

**Prerequisites**

Principles of Math 10 co-requisite: Principles of Math 11

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 154 Surveying**

2 Credits

This introductory surveying course provides the student with skills in compassing, distance and slope measuring, profile and differential leveling, conducting closed and open traverses, and area determination. Familiarizations with various survey equipment including; use and care of magnetic compasses, levels, clinometers and various distance-measuring instruments. Basic surveying will draw upon the student's knowledge of algebra, geometry, trigonometry and drafting skills. The objective of the course will be to provide as much "hands on" experience with the survey equipment as possible while maintaining an appropriate amount of time with survey theory and methods. Field exercises will be based on actual survey procedures used in the natural resource field in industry and government. The appropriate selection of survey equipment to complete various data collection objectives will be discussed.

**Prerequisites**

Principles of Math 10 co-requisite: Principles of Math 11

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 160 Solid Waste Management**

1 Credit

The course will give a theoretical and on site introduction into municipal solid waste management practices. Canadian municipalities are implementing customized programs for minimization, reuse, recover and recycling of waste. Innovative and environmentally sound Canadian solutions to collect, treat and dispose of solid waste are being employed internationally. Technologies such as raw material substitution, computer optimization and process redesign can reduce, reuse, recycle and recover wastes in industrial processes and will be discussed. The course will also introduce concepts such as incineration, solidification and stabilization, as well as destruction of bio-hazardous and nuclear waste and persistent organic pollutants.

**Prerequisites**

English Studies 11, English First Peoples 11 or equivalent and Life Science 11 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 162 Wastewater Treatment Standards and Procedures**

1 Credit

the course will give a theoretical and on site introduction to multi-stage treatment processes of municipal and industrial waste water according to the Canadian Environmental Protection Act and the fisheries Act. Students will visit municipal and industrial wastewater treatment managers in the north coast area. Newest wastewater treatment technologies as well as wastewater prevention strategies will be presented and discussed.

**Prerequisites**

English Studies 11, English First Peoples 11 or equivalent and Life Sciences 11 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)



**ACE 164 Drinking Water Treatment Standards and Procedures**

1 Credit

The course will give a theoretical and on site introduction into municipal pre-consumer drinking water treatment technologies from surface and groundwater sources. It will explain the standards and management practices accepted in Canada, outline the treatment facility operator certification process, water quality testing and standards, treatment requirements, the lab accreditation process and residential water treatment devices. Half of the course hours will be spent on site visits and discussions with water treatment facility operators. Implication of drinking water quality for communal and individual health will be covered as an additional topic of importance.

**Prerequisites**

English Studies 11, English First Peoples 11, or equivalent, and Life Sciences 11 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 166 Sampling Methods Procedures**

1 Credit

This course will introduce students to the sampling standards as outlined in the British Columbia Field Sampling Manual, 2004 Edition, or an updated version. Course participants will follow the manual to collect samples in the field and will be made aware of the important details that can easily render a sample unusable or add bias to results.

**Prerequisites**

English Studies 11 or English First Peoples 11 or equivalent and Life Science 11 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 170 Mariculture Technology**

2 Credits

The course introduces global mariculture species, techniques, economics, trends and markets in general techniques but will be especially directed towards detailed understanding of mollusc and seaweed mariculture on BC's coast. Topics covered will range from intensive, extensive, and semi-intensive aquaculture in the ocean, life cycles of aquaculture species, characteristics which make a good aquaculture organism, economic and logistical feasibility and latest trends. Old and new emergent finfish species and their culture, new echinoderm culture techniques phyto and zoo plankton culture and the currently emerging mollusc culture and its resource management implications on BC's northcoast will be covered in depth. This course is required for students that want to complete the Fisheries and Mariculture Stewardship certificate within the ACE program and will be an elective for other streams within the ACE program.

**Prerequisites**

English Studies 10, English First Peoples 10 or equivalent and Foundations of Math 10 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 172 Mariculture Project**

2 Credits

The project mariculture project course will allow students to apply their knowledge gained in the introductory mariculture course (ACE 170) in form of a project. The project will require individual or groups of students to design and plan a mariculture project of their choice on BC's coast or inland. Components required will be an overall project plan, an economic feasibility study based on a template, collection of physical copies of all permits required to start the project, the construction of a functional model of a project detail and well documented background research. During the last session, students introduce their project in a presentation to the class and other interested audience. This course is required for students that want to complete the Fisheries and Mariculture Stewardship certificate within the ACE program and will be an elective for other streams within the ACE program.

**Prerequisites**

ACE 170

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 174 British Columbia Wildlife Identification**

4 Credits

This course focuses on the identification of British Columbia vertebrates in Class Mammalia, Aves, Reptilia and Amphibia. Students will learn the morphology and physical characteristics of the orders and families in each Class. Students will also learn to recognize species and identify them to their family and order through the examination of their skulls and physical attributes. Students will understand each species' habitat requirements and preferences.

**Prerequisites**

English Studies 11 or English First Peoples 11 or equivalent co-requisite: Life Science 11 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 175 Wildlife Conservation & Monitoring Population Management**

3 Credits

The course will provide students with experience in field methods used by wildlife biologists to study mammal, bird, reptile and amphibian populations. Students will learn common techniques of wildlife capture, marking and monitoring, and will practice proper handling and releasing methods of wild animals. Students will also examine the ethical and humane considerations that are involved in wildlife research. Students will also learn to recognize species and identify them to their family and order through the examination of their skulls and physical attributes. Students will understand each species' habitat requirements and preferences and gain knowledge of the laws, regulations and management strategies that maintain and enhance the health and diversity of British Columbia wildlife.

**Prerequisites**

Take BI-11

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)



**ACE 176 Wildlife Habitate and Population Management**

4 Credits

This course will provide students with an in-depth understanding of wildlife in relation to land, water and people. Students will gain knowledge of the laws and regulations that maintain and enhance the health and diversity of British Columbia's wildlife. Students will be introduced to characteristics of wildlife populations, special habitat attributes, and habitat management practices for big game animals, small mammals, waterfowl, shore and upland birds, non-game animals and marine mammals. Students will learn techniques of collecting population and biological data on various wildlife populations.

**Prerequisites**

Take BI-11

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 180 Stream Habitat Assessment**

3 Credits

This course introduces the methodologies of conducting a fish and fish habitat assessment on stream ecosystems. Students will learn to provide information regarding fish species characteristics, distributions and relative abundance, as well as stream reach biophysical data for interpretation of habitat sensitivity and capability for fish production. Students will also learn how to sample for fish presence, collect data on stream habitat characteristics and gain an in-depth understanding of the stream habitat requirements for salmonid species.

**Prerequisites**

English Studies 11, English First Peoples 11 or equivalent and Principles of Math 11 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 181 Stream Habitat Restorations**

3 Credits

Students will be introduced to the natural processes and resource development activities that can affect stream ecosystems and learn to recognize signs of habitat degradation. Students will also learn techniques used to prevent and control damage of stream habitats and gain skills in improving and restoring stream ecosystems.

**Prerequisites**

English Studies 11, English First Peoples 11 or equivalent and Principals of Math 10 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 182 Stream Habitat Assessment & Restoration**

3 Credits

This course introduces the methodologies of conducting a fish and fish habitat assessment on stream ecosystems. Students will learn to provide information regarding fish species characteristics, distributions and relative abundance, as well as stream reach biophysical data for interpretation of habitat sensitivity and capability for fish production. Students will also learn how to sample for fish presence, collect data on stream habitat characteristics and gain an in-depth understanding of the stream habitat requirements for salmonid species. Students will be introduced to the natural processes and resource development activities that can affect stream ecosystems and learn to recognize signs of habitat degradation. Students will also learn techniques used to prevent and control damage of stream habitats and gain skills in improving and restoring stream ecosystems.

**Prerequisites**

English Studies 11, English First Peoples 11 or equivalent and Principles of Math 10 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 190 Temperate Rainforest Ecology**

4 Credits

This course focuses on the ecology of the North Coast temperate rainforest. It will introduce the concept of plant associations, forest types and Biogeoclimatic zoning. Emphasis will be placed on tree, shrub and plant identification at the species level. Assembly of a tree and shrub herbarium collection is the major course project. Students will also be introduced to the physical, chemical and biological properties, analysis, genesis and classification of soils with emphasis on factors which influence plant growth. Fish and forest interactions and the management issues surrounding these resources will also be explored in a holistic fashion. This course provides vital skills and understanding of the terrestrial component of the coastal environment.

**Prerequisites**

English Studies 11 or English First Peoples 11 or equivalent and Life Sciences 11 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)



**ACE 192 Environmental Impact Assessment**

4 Credits

This course examines the conceptual framework and practice of EIA and the application of those ideas in the ancient coastal marine and forest ecosystems of British Columbia and the Pacific Northwest. Environmental impact statements related to specific examples such as Clayoquot Sound and the Spotted Owl will be considered to see how the ideals of EIA have been translated into practice. The aim of the course is to help students develop an appreciation of the techniques, mechanisms, and limitations of EIA and ultimately to help students distinguish between a good and bad EIA, contribute to the former, and challenge the latter.

**Prerequisites**

English studies 11, English First Peoples 11 or equivalent and Life Sciences 11 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 194 Environmental Site Assessment**

2 Credits

This course will help participants to complete an environmental assessment (EA) that meets requirements of the Canadian Environmental Assessment Act. The course will introduce the understanding of environmental assessment concepts, principles and definitions. Prepare students for managing effective environmental assessments, including: identifying and predicting environmental effects, scoping, involving the public, mitigating environmental effects, evaluating significance and reporting EA findings and enhance the understanding of environmental assessment decision making. In a hands-on approach, interactive exercises, short presentations, group discussions, and case-studies an EA will be completed in a team setting.

**Prerequisites**

English Studies 11, English First Peoples 11 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 195 Environmental Monitoring: Principles & Techniques**

2 Credits

Environmental monitoring is an essential tool for determining the impacts of various land and water use activities on ecosystems and can become the basis for decision-making and resolving of land use conflicts. In this course students will learn, through both classroom instruction and hands on field experience, how to plan and prepare for an environmental monitoring field project, including industry standard sampling techniques of soil, water and air. Emphasis will be placed on the importance of quality assurance in order to accurately reflect the risks and uncertainties associated with various industrial, recreational and residential development or land use activities.

**Prerequisites**

English Studies 11, English First Peoples 11 or equivalent

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 196 Instrument Technology**

3 Credits

This course will introduce students to marine sensor technology, including underwater cabled observatories, shore-based coastal weather stations, autonomous instrument deployments and ship-based surveys. Students will learn about the diversity of marine sensors, why and how they are used, and the challenges and opportunities presented by operating technology in a marine environment. The course will provide opportunities for students to design and test sensor apparatus both in the lab and the field, analyze actual sensor data, and plan their own field missions. An introduction to basic seamanship at the end of the course will help students gain some of the skills necessary to work safely in the field.

**Prerequisites**

Pre-Calculus 11 or Foundations of Math 11

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

**ACE 197 Environmental Monitoring Techniques**

3 Credits

Environmental monitoring is an essential tool that aids in managing the impacts of various land use activities on British Columbia's diverse ecosystems and can become the basis of resolving land and marine use conflicts. In this course, students will study the principals of environmental monitoring and will learn the role of an environmental monitor. Students will learn techniques in water quality monitoring and marine sensor technology. Students will also be introduced to shore based coastal weather stations, air quality monitoring and explore wastewater management. Emphasis will be placed on using best management practices and the importance of quality assurance to accurately reflect and report on the risks associated with various industrial, recreational and residential development or land and marine use activities.

**Prerequisites**

Biology 11

**Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)



## **ACE 199 Applied Proposal and Grant Writing**

1 Credit

The course will introduce the basic elements, techniques and real-life application of proposal writing based on the example of one project per student. Projects will be chosen in collaboration with local government agencies or non profit organizations. All students will be expected to write and submit their proposal to a funding agency and be prepared to initiate the resulting project for the collaborating organization. Students will develop a project idea, gather information, formulate needs, objectives and goals, develop a detailed budget and develop project implementation and evaluation plans within realistic timelines in a team approach. All project plans will be visualized through the use of GANTT charts and various appropriate software packages. Local project planners and proposal evaluators will be invited to report on their professional experiences in class.

### **Prerequisites**

English Studies 11, English First Peoples 11 or equivalent

### **Transfer Credits**

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## **ACE 200 Applied Proposal Writing and Project Planning**

4 Credits

This course will introduce the basic elements, tricks and real-life application of proposal writing on the example of one project per student. Projects will be chosen in collaboration with local government agencies or not for profit organizations. All students will be expected to write and submit their proposal to a funding agency and be prepared to initiate the resulting project for the collaborating organization. Students will develop a project idea, gather information, formulate needs, objectives and goals, develop a detailed budget and develop project implementation and evaluation plans within realistic timelines in a team approach. All project plans will be visualized through the use of GANTT charts and an introduction to MSPProject software. Local project planners and proposal evaluators will be invited to report on their professional experiences in class.

### **Prerequisites**

English Studies 11, English First Peoples 11 or equivalent

### **Transfer Credits**

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