Education for Sustainable Development Goals

JSS ACADEMY OF HIGHER EDUCATION & RESEARCH

Teaching & Learning of Activities in Achieving UN Sustainable Development Goals

Teaching & Learning Objective Handbook SDG-14-Life Below Water

2022

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PREFACE

The United Nations' 2030 Agenda for Sustainable Development was adopted Globally in September 2015. It is underpinned by 17 Sustainable Development Goals (SDGs) and 169 targets and applies to every country. It helps people from various counties to work together to promote sustained and inclusive economic growth, social development and environmental protection and to benefit all, including future generations. The 2030 Agenda for Sustainable Development sets forth "a plan of action for people, planet and prosperity " and "seeks to strengthen universal peace in larger freedom".

This universal agenda requires an integrated approach to sustainable development and collective action, at all levels, to address the challenges of our time, with an overarching imperative of 'leaving no one behind' and addressing inequalities and discrimination as the central defining feature. Many countries , institutions and organisations have already started to translate the new agenda into their development plans, strategies and visions.

JSSAHER'S Social Responsibility is an approach of ethical and intelligent management, which involves both its impact on its human, social and natural context and its active role on the promotion of Sustainable Human Development of the country. Within this approach, "Sustainable Campus" is a strategy that strives to reduce the ecological footprint of the Institution via a rational use of resources and to educate the JSSAHER community on the ethics of sustainability.

Supporting the JSSAHER'S Social Responsibility, the SDG Hand Book explains the SDGs and their connection between the various goals and targets of JSSAHER . It provides a blueprint to help, identify, implement and achieve the Sustainable Development Goals (SDGs) at JSS AHER.

As the process moves towards implementation, there is a need to address the scope and systemic nature of the 2030 Agenda and the urgency of the challenges. This requires a wide range of tools and science-based analysis to navigate that complexity and to realise the ambition. JSSAHER having in place effective governance systems, institutions, partnerships, and intellectual and financial resources favouring effective, efficient and coherent approach for implementation of SDGs.

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https://www.jssuni.edu.in/JSSWeb/WebShowFromDB.aspx?MID=11011&CID=0&PID=10001

PREAMBLE

Education for

Sustainable Development Goals

By 2030, ensure that all learners acquire knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non- violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.

Source: **The Sustainable Development Goals Report 2022**

http://www.un.org/sustainabledevelopment/sustainable- development-goals

Access to Learning objectives for SDG-14

Education for Sustainable Development Goals: learning objectives - UNESCO Digital Library

United Nations, n.d.

OBJECTIVE OF JSS ACADEMY OF HIGHER EDUCATION & RESEARCH TO PROMOTE EDUCATION FOR SUSTAINABLE DEVELOPMENT GOALS OF THE UNITED NATION IS TO MATCH THE TEACHING & LEARNING ACTIVITIES WITH SUSTAINABLE DEVELOPMENT GOALS THROUGH CURRICULUM DEVELOPMENT, ENHANCED RESEARCH AND

EXTENDED OUTREACH ACTIVITIES.

INTRODUCTION

The Sustainable Development Goals – an ambitious and universal agenda to transform our world
On 25 September 2015, the UN General Assembly adopted the 2030 Agenda for Sustainable Development (UN, 2015). This new global framework to redirect humanity towards a sustainable path was developed following the United Nations Conference on Sustainable Development (Rio+20) in Rio de Janeiro, Brazil in June 2012, in a three-year process involving UN Member States, national surveys engaging millions of people and thousands of actors from all over the world.

At the core of the 2030 Agenda are 17 Sustainable Development Goals (SDGs). The universal, transformational and inclusive SDGs describe major development challenges for humanity. The aim of the 17 SDGs is to secure a sustainable, peaceful, prosperous, and equitable life on earth for everyone now and in the future. The goals cover global challenges that are crucial for the survival of humanity. They set environmental limits and set critical thresholds for the use of natural resources. The goals recognize that ending poverty must go together with strategies that build economic development. They address a range of social needs including education, health, social protection, and job opportunities while tackling climate change and environmental protection. The SDGs address key systemic barriers to sustainable development such as inequality, unsustainable consumption patterns, weak institutional capacity, and environmental degradation.

For the goals to be reached, everyone needs to do their part: governments, the private sector, civil society and every human being across the world. Governments are expected to take ownership and establish national frameworks, policies, and measures for the implementation of the 2030 Agenda.

A key feature of the 2030 Agenda for Sustainable Development is its universality and indivisibility. It addresses all countries – from the Global South and the Global North – as target countries. All countries subscribing to the 2030 Agenda are to align their own development efforts with the aim of promoting prosperity while protecting the planet to achieve sustainable development. Thus, with respect to the SDGs, all countries can be considered as developing and all countries need to take urgent action.

The 17 Sustainable Development Goals (SDGs)

No Poverty – End poverty in all its forms everywhere

Zero Hunger – End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Good Health and Well-Being – Ensure healthy lives and promote well-being for all at all ages

Quality Education – Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Gender Equality – Achieve gender equality and empower all women and girls

Clean Water and Sanitation – Ensure availability and sustainable management of water and sanitation for all

Affordable and Clean Energy – Ensure access to affordable, reliable, sustainable, and clean energy for all

Decent Work and Economic Growth – Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all

Industry, Innovation and Infrastructure – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Reduced Inequalities – Reduce inequality within and among countries

Sustainable Cities and Communities – Make cities and human settlements inclusive, safe, resilient and sustainable

Responsible Consumption and Production – Ensure sustainable consumption and production patterns

Climate Action – Take urgent action to combat climate change and its impacts

Life below Water – Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Life on Land – Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Peace, Justice and Strong Institutions – Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Partnerships for the Goals – Strengthen the means of implementation and revitalize the global partnership for sustainable development

Source: http://www.un.org/sustainabledevelopment/sustainable- development-goals

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

TEACHING & LEARNING OBJECTIVES FOR SDG 14
JSS DENTAL COLLEGE & HOSPITAL

Conserve and sustainably use the oceans, seas, and marine resources
for sustainable development

Teaching & Learning objectives for SDG 14 "Life below Water"

Subject/ topic/ course in regular curriculum relating to SDG 14	• Sewage treatment to prevent pollution of water bodies	• Public Health Dentistry • All undergraduate and post graduate students
Cognitive Teaching & learning objectives	• The learner understands basic marine ecology, ecosystems, predator-prey relationships, etc. • The learner understands the connection of many people to the sea and the life it holds, including the sea's role as a provider of food, jobs and exciting opportunities. • The learner knows the basic premise of climate change and the role of the oceans in moderating our climate. • The learner understands threats to ocean systems such as pollution and overfishing and recognizes and can explain the relative fragility of many ocean ecosystems including coral reefs and hypoxic dead zones. • The learner knows about opportunities for the sustainable use of living marine resources.	
Socio-emotional Teaching & learning objectives	• The learner can speak for sustainable fishing practices. • The learner can show people the impact humanity is having on the oceans (biomass loss, acidification, pollution, etc.) and the value of clean healthy oceans. • The learner can influence groups that engage in unsustainable production and consumption of ocean products. • The learner can reflect on their own dietary needs and question whether their dietary habits make sustainable use of limited resources of seafood. • The learner can empathize with people whose livelihoods are affected by changing fishing practices.	
Behavioural Teaching & learning objectives	• The learner can research their country's dependence on the sea. • The learner can debate sustainable methods such as strict fishing quotas and moratoriums on species in danger of extinction. • The learner is able to identify access and buy sustainably harvested marine life, e.g. ecolabel certified products. • The learner can contact their representatives to discuss overfishing as a threat to local livelihoods. • The learner can campaign for expanding no-fish zones and marine reserves and for their protection on a scientific basis.	

Suggested topics for SDG 14 "Life below Water"

The hydrosphere: The water cycle, cloud formation, water as the great climate regulator

Management and use of marine resources (renewables and non-renewables): global commons and overfishing, quotas and how they are negotiated, aquaculture, seaweed, mineral resources

Sustainable Marine Energy (renewable energies, wind turbines and their controversy)

Marine ecology – the food web, predators and prey, competition, collapse

Coral reefs, coasts, mangroves and their ecological importance

Sea level rise and countries that will experience total or partial loss of land; climate refugees and what a loss of sovereignty will mean

The oceans and international law: international waters, territory disputes, flags of convenience and their related issues

Ocean pollutants: plastics, microbeads, sewage, nutrients and chemicals

The deep ocean and deep-sea creatures

Cultural relationships to the sea – the sea as a source of cultural ecosystem services such as recreation, inspiration and building of cultural identity

Examples of learning approaches and methods for SDG 14 "Life below Water"

Develop and run a (youth) action project related to life below waterDo

excursions to coastal sites

Debate sustainable use and management of fishery resources in school

Role-play islanders moving country because of sea-level rise

Conduct a case study about cultural and subsistent relationships to the sea in different countries

Conduct lab experiments to provide students with evidence of ocean acidification

Develop an enquiry-based project: "Do we need the ocean or does the ocean need us?"

TEACHING & LEARNING OBJECTIVES FOR SDG 14
JSS COLLEGE OF PHARMACY, OOTY

JSSCPO

Subject/ topic/ course in regular curriculum relating to SDG 14	• The professional programs/ Courses of Pharmacy are not technically associated with SDG No. 14

TEACHING & LEARNING OBJECTIVES FOR SDG 14
FACULTY OF HEALTH SYSTEM MANAGEMENT STUDIES

Dept. of HSMS

Subject/ topic/ course in regular curriculum relating to SDG 14	• Environmental studies- BBA- First Semester
Cognitive Teaching & learning objectives	• The learner understands basic marine ecology, ecosystems, predator-prey relationships, etc. • The learner understands the connection of many people to the sea and the life it holds, including the sea's role as a provider of food, jobs and exciting opportunities.
Socio-emotional Teaching & learning objectives	• The learner can speak for sustainable fishing practices. • The learner can show people the impact humanity is having on the oceans (biomass loss, acidification, pollution, etc.) and the value of clean healthy oceans. • The learner can influence groups that engage in unsustainable production and consumption of ocean products.
Behavioural Teaching & learning objectives	• The learner can debate sustainable methods such as strict fishing quotas and moratoriums on species in danger of extinction. • The learner is able to identify, access and buy sustainably harvested marine life, e.g. ecolabel certified products. • The learner can contact their representatives to discuss overfishing as a threat to local livelihoods.

TEACHING & LEARNING OBJECTIVES FOR SDG 14
JSS SCHOOL OF LIFE SCIENCES, OOTY

SLS, Ooty

Cognitive Teaching & learning objectives	• The learner understands basic marine ecology, ecosystems, predator-prey relationships, etc. • The learner understands the connection of many people to the sea and the life it holds, including the sea's role as a provider of food, jobs and exciting opportunities. • The learner knows the basic premise of climate change and the role of the oceans in moderating our climate. • The learner understands threats to ocean systems such as pollution and overfishing and recognizes and can explain the relative fragility of many ocean ecosystems including coral reefs and hypoxic dead zones. • The learner knows about opportunities for the sustainable use of living marine resources.
Socio-emotional Teaching & learning objectives	• The learner can speak for for sustainable fishing practices. • The learner can show people the impact humanity is having on the oceans (biomass loss, acidification, pollution, etc.) and the value of clean healthy oceans. • The learner can influence groups that engage in unsustainable production and consumption of ocean products. • The learner can reflect on their own dietary needs and question whether their dietary habits make sustainable use of limited resources of seafood. • The learner can empathize with people whose livelihoods are affected by changing fishing practices.
Behavioural Teaching & learning objectives	• The learner can research their country's dependence on the sea. • The learner can debate sustainable methods such as strict fishing quotas and moratoriums on species in danger of extinction. • The learner is able to identify, access and buy sustainably harvested marine life, e.g. ecolabel certified products. • The learner can contact their representatives to discuss overfishing as a threat to local livelihoods. • The learner can campaign for expanding no-fish zones and marine reserves and for their protection on a scientific basis.

Suggested topics for SDG 14 "Life below Water"

The hydrosphere: The water cycle, cloud formation, water as the great climate regulator

Management and use of marine resources (renewables and non-renewables): global commons and overfishing, quotas and how they are negotiated, aquaculture, seaweed, mineral resources

Sustainable Marine Energy (renewable energies, wind turbines and their controversy)

Marine ecology – the food web, predators and prey, competition, collapse

Coral reefs, coasts, mangroves and their ecological importance

Sea level rise and countries that will experience total or partial loss of land; climate refugees and what a loss of sovereignty will mean

The oceans and international law: international waters, territory disputes, flags of convenience and their related issues

Ocean pollutants: plastics, microbeads, sewage, nutrients and chemicals

The deep ocean and deep-sea creatures

Cultural relationships to the sea – the sea as a source of cultural ecosystem services such as recreation, inspiration and building of cultural identity

Examples of learning approaches and methods for SDG 14 "Life below Water"

Develop and run a (youth) action project related to life below water

Do excursions to coastal sites

Debate sustainable use and management of fishery resources in school

Role-play islanders moving country because of sea-level rise

Conduct a case study about cultural and subsistent relationships to the sea in different countries

Conduct lab experiments to provide students with evidence of ocean acidification

Develop an enquiry-based project: "Do we need the ocean or does the ocean need us?"

DEPARTMENT OF YOGA

Subject/ topic/ course in regular curriculum relating to SDG 14	• Environmental studies, Environmental Psychology
Cognitive Teaching & learning objectives	**At the end of 1st & 2nd year learner should be able to** • Understand the importance of marine sources for the nourishment of society in a sustainable way. • Understand the sustainable use of marine resources • Understand the interconnection between the community and the marine life • Know the causes of marine pollution • Understand the importance to preserve the marine life for the sustainable living • Know the marine conservation act • Understand the notion of veganism and Carnitarians • Understand harmful algal bloom (HAB)
Socio-emotional Teaching & learning objectives	**At the end of final year learner should be able to** • Educate public on the protection of marine resources • Create awareness on the ways to reduce marine pollution • Create awareness on the marine conservation act
Behavioural Teaching & learning objectives	**At the end of the course learner should be able to** • Bring about a change at the individual as well as at the community level and help in reducing the activities that pollute the marine system. • Bring about a change in sustainable consumption of marine foods

Suggested topics for SDG 14 "Life below Water"

- Acquatic eco system
- Endangered and endemic species of India
- Water pollution
- Ocean pollutants: plastics, microbeads, sewage, nutrients and chemicals
- Management and use of marine resources (renewables and non-renewables)
- Marine ecology – the food web, predators and prey, competition, collapse
- Sea level rise and countries that will experience total or partial loss of land; climate refugees and what a loss of sovereignty will mean
- The oceans and international law
- Cultural relationships to the sea – the sea as a source of cultural ecosystem services such as recreation, inspiration and building of cultural identity

Examples of learning approaches and methods for SDG 14 "Life below Water"

- Develop and run a (youth) campaign related to
- Demonstrate the activities of save ocean campaign
- Group discussion and brain stroming sessions on UNDP act to save ocean and ocean innovation challenge
- excursions to coastal sites

DEPARTMENT OF MICROBIOLOGY

Subject/ topic/ course in regular curriculum relating to SDG 14	• Microbial Diversity (BSc I Sem); Microbiological Analysis of Air & Water (BSc III Sem); Bioremediation & Microbial Technology (BSc V Sem); Microbial Biotechnology (BSc VI Sem); Extremophilic Microbiology (BSc VIII Sem); Advances in Bioremediation & Microbial Technology (MSc III Sem); Medical Microbiology & Immunology (MSc III Sem)
Cognitive Teaching & learning objectives	•The learner understands basic marine and freshwater microbiology, and role of microbes in ecosystems and food chain; understands the beneficial and pathogenic behavior of marine and freshwater microbes; knows the natural and bio-based products for sustainable use that can be derived from marine microbes; understands the impacts of global warming on microbial communities; understands the use of bioremediation and cleaning oil spill in marine environment.
Socio-emotional Teaching & learning objectives	• The learner can speak for sustainable use of marine microbial resources; show people the impact of microbial activity in maintaining equilibrium of ocean ecostytems; influence and educate about sustainable production and consumption of ocean products by using microbial techniques; reflect on their own dietary needs using microbes cultivated in aqua systems rich in proteins such as Spirulina and other microalgae.
Behaviorial Teaching & Learning objectives	• The learner can research their country's freshwater and marine water microbial diversity; debate sustainable methods of maintaining coral reefs with beneficial marine microbes; to produce and market sustainably harvested marine microbes and their products that are ecolabel certified; contact their representatives to discuss about pathogenic marine microbes and their control measures to protect aquaculture; campaign for safeguarding marine and fresh water environments from contamination with pathogens, eutrophication and algal blooms.

Learning approaches and methods for SDG 14

- Role of microbes in reducing marine pollution (degrade plastic), protecting and restoring ecosystem, reducing ocean acidification
- Use of marine microbes to produce bioproducts and enzymes from cold marine environments and hot hydrothermal vents
- Use of microbes to prevent coral-reef degradation
- Detection of pathogenic microbes from aquatic ecosystem
- Understand diversity of microbes in fresh and marine waters

Suggested topics for students workshop

- Develop protocols for prospecting microbial bioproducts
- Debate sustainable use and management of microbes in water
- Conduct a case study on endosymbiotic relation of microbes with other aquatic organisms
- Conduct lab experiments on bioremediation and microbial degradation of plastics in marine waters
- Develop project: "cleaning oil spill in marine environment using robust growing microbes"

DEPARTMENT OF ENVIRONMENTAL SCIENCES

Course Name in curriculum relating to SDG 14	• Introduction to Environmental Science (DSC 01) • Natural Resource Management (DSC 03) • Environmental Studies (AECC 01) • Introduction to Environmental Microbiology (DSC 07) • Water and Wastewater Treatment (DSC 07) • Hydrology (DSE 01a) • Integrated Water Resource Management (DSE 02a) • Environmental Monitoring and Techniques (DSC 10) • Eco-restoration and Development (DSC 11) • Solid Waste Management (DSC 13) • Water Supply and Sanitation (DSE 03a) • Water Energy and Food Nexus (DSE 04a) • Bioremediation and Techniques (DSE 05b)
Cognitive Teaching & learning objectives	• The learner understands basic aquatic ecology, marine ecosystems, predator-prey relationships, etc. • The learner understands the connection of many people to the ocean and the life it holds, including the sea's role as a provider of food, jobs and exciting opportunities. • The learner knows the basic premise of climate change and the role of the oceans in moderating our climate. • The learner understands threats to ocean systems such as pollution and overfishing and recognizes and can explain the relative fragility of many ocean ecosystems including coral reefs and hypoxic dead zones. • The learner knows about opportunities for the sustainable use of living marine resources.
Socio-emotional Teaching & learning objectives	• The learner can speak for sustainable aquaculture such as fishing practices. • The learner can show people the impact humanity is having on the oceans (biomass loss, acidification, pollution, etc.) and the value of clean healthy oceans. • The learner can influence groups that engage in unsustainable production and consumption of ocean products. • The learner can reflect on their own dietary needs and question whether their dietary habits make sustainable use of limited resources of seafood. • The learner can empathize with people whose livelihoods are affected by changing fishing practices.
Behavioral	• The learner can research their dependence on the

Teaching & learning objectives	aquatic ecosystem for food and other economic activities. • The learner can debate sustainable methods such as strict fishing quotas and moratoriums on species in danger of extinction. • The learner is able to identify, access and buy sustainably harvested marine life, e.g. ecolabel certified products. • The learner can contact their representatives to discuss overfishing as a threat to local livelihoods. • The learner can campaign for expanding no-fish zones and marine reserves and for their protection on a scientific basis.

Suggested topics for SDG 14 "Life below Water"

- The hydrosphere and aquatic ecosystem: The water cycle, cloud formation, water as the great climate regulator
- Management and use of marine resources (renewables and non-renewables): global commons and overfishing, quotas and how they are negotiated, aquaculture, seaweed, mineral resources
- Sustainable Marine Energy (renewable energies, wind turbines and their controversy)
- Marine ecology – the food web, predators and prey, competition, collapse
- Coral reefs, coasts, mangroves, and their ecological importance
- Sea level rise and countries that will experience total or partial loss of land; climate refugees and what a loss of sovereignty will mean
- The oceans and international law: international waters, territory disputes, flags of convenience and their related issues
- Ocean pollutants: plastics, microbeads, sewage, nutrients and chemicals
- The deep ocean and deep-sea creatures
- Cultural relationships to the sea – the sea as a source of cultural ecosystem services such as recreation, inspiration and building of cultural identity

Examples of learning approaches and methods for SDG 14 "Life below Water"

- Develop and run a action project related to life below water specially ocean ecosystem and conservation
- Do excursions to coastal sites, pollution control, ocean temperature raise, etc.
- Debate sustainable use and management of ocean ecosystem, biodiversity, and fishery resources in school
- Role-play islanders moving country because of sea-level rise
- Conduct a case study about cultural and subsistent relationships to the sea in different countries
- Conduct lab experiments to provide students with evidence of ocean acidification
- Develop an enquiry-based project: "Do we need the ocean or does the ocean need us?"

DEPARTMENT OF NUTRITION & DIETETICS

Subject/ topic/ course in regular curriculum relating to SDG 14	• The course MSc in Nutrition & Dietetics, indirectly supports conservation and sustainability of marine resources.
Cognitive Teaching & learning objectives	**At the end of 2nd year and course the learner should be able to,** • Understands the importance of marine life as a source of diet diversity for all, improving economy of specific communities. • The learner knows the impact of climate change, increased industrialization, pollution on marine life.
Socio-emotional Teaching & learning objectives	**At the end of 2nd year and course the learner should be able to,** • Can speak for sustainable fishing practices, • The learner can provide food security and specific nutrient support for all age groups, ensuring good cognitive and overall development for all. • The learner can reflect on their own dietary needs, the dietary habits making sustainable use of limited resources of seafood.
Behavioural Teaching & learning objectives	**At the end of 2nd year and course the learner should be able to,** • Can directly / indirectly able to identify, access and buy sustainably harvested marine life, e.g. Ecolabel certified products. • The learner can educate on overfishing reducing environment pollution to protect marine life.

Suggested topics for SDG 14 "Life below Water"

- Concepts of safe water, sanitary sources of water, water purification processes, water quality standards,
- Strategies for water conservation and rainwater harvesting
- Reasons for water borne diseases/jaundice/hepatitis/ diarrheal diseases
- Toxic effects of water pollution & hazards of occupation and industry.

Examples of learning approaches and methods for SDG 14 "Life below Water"

- Awareness programs on rainwater harvesting and use sustainable source of energy
- Poster competition, essay writing competition, role play on World Environment Day celebration .
- Awareness on direct / indirect determinants effecting access to sustainable harvested marine life

MSc Sports Nutrition & Management

Subject/ topic/ course in regular curriculum relating to SDG 14	• Sports specific diets
Cognitive Teaching & learning objectives	At the end of 1st professional year, the student should be able to • understand the delicate balance of the marine ecosystems, and ○ learns to maneuver around it for the water sports
Socio-emotional Teaching & learning objectives	At the end of program, the student should be able to • showcase the impact of water sports on water and water life and the value of clean healthy oceans.
Behavioural Teaching & learning objectives	At the end of the program, the student should be able to • identify, access and buy sustainably harvested marine life, e.g., ecolabel certified products.

BSc Food, Nutrition & Dietetics

Subject/ topic/ course in regular curriculum relating to SDG 14	• Food and Nutrition Security, Environmental studies, Food Toxicology
Cognitive Teaching & learning objectives	**At the end of 1st & 2nd year learner should be able to** • Understand the importance of marine sources for the nourishment of society in a sustainable way. • Understand the sustainable use of marine resources • Understand the interconnection between the community and the marine life • Know the causes of marine pollution • Understand the importance to preserve the marine life for the sustainable living • Know the marine conservation act • Understand the notion of veganism and Carnitarians • Understand harmful algal bloom (HAB)
Socio-emotional Teaching & learning objectives	**At the end of th 3rd and 4th year learner should be able to** • Educate public on the protection of marine resources • Create awareness on the ways to reduce marine pollution • Create awareness on the marine conservation act • Help people reflect on their own dietary needs and question whether their dietary habits make sustainable use of limited resources of seafood.
Behavioural Teaching & learning objectives	**At the end of the course learner should be able to** • Bring about a change at the individual as well as at the community level and help in reducing the activities that pollute the marine system. • Bring about a change in sustainable consumption of marine foods

Suggested topics for SDG 14 "Life below Water"

Acquatic eco system

Endangered and endemic species of India

Water pollution

Ocean pollutants: plastics, microbeads, sewage, nutrients

and chemicals

Management and use of marine resources (renewables and non-renewables)

Marine ecology – the food web, predators and prey, competition, collapse

Sea level rise and countries that will experience total or partial loss of land; climate refugees and what a loss of sovereignty will mean

The oceans and international law

Examples of learning approaches and methods for SDG 14 "Life below Water"

Develop and run a (youth) campaign related to

Demonstrate the activities of save ocean campaign

Group discussion and brain stroming sessions on

UNDP act to save ocean and ocean innovation

challenge

excursions to coastal sites

DEPARTMENT OF MEDICAL PHYSICS

Subject/ topic/ course in regular curriculum relating to SDG 14	• Multivariate Analysis • Design and Analysis of Experiment
Cognitive Teaching & learning objectives	• The learner understands basic marine ecology, ecosystems, predator-prey relationships, etc. • The learner understands the connection of many people to the sea and the life it holds, including the sea's role as a provider of food, jobs and exciting opportunities. • The learner knows the basic premise of climate change and the role of the oceans in moderating our climate. • The learner understands threats to ocean systems such as pollution and overfishing and recognizes and can explain the relative fragility of many ocean ecosystems including coral reefs and hypoxic dead zones. • The learner knows about opportunities for the sustainable use of living marine resources.
Socio-emotional Teaching & learning objectives	• The learner can speak for for sustainable fishing practices. • The learner can show people the impact humanity is having on the oceans (biomass loss, acidification, pollution, etc.) and the value of clean healthy oceans. • The learner can influence groups that engage in unsustainable production and consumption of ocean products. • The learner can reflect on their own dietary needs and question whether their dietary habits make sustainable use of limited resources of seafood. • The learner can empathize with people whose livelihoods are affected by changing fishing practices.
Behavioural Teaching & learning objectives	• The learner can research their country's dependence on the sea. • The learner can debate sustainable methods such as strict fishing quotas and moratoriums on species in danger of extinction. • The learner is able to identify, access and buy sustainably harvested marine life, e.g. ecolabel certified products. • The learner can contact their representatives to discuss overfishing as a threat to local livelihoods. • The learner can campaign for expanding no-fish zones and marine reserves and for their protection on a scientific basis.

Suggested topics for SDG 14 “Life below Water”

- ✓ Application of machine learning in ocean data
- ✓ ML Algorithms
- ✓ Experimental design and statistical analysis

Examples of learning approaches and methods for SDG 14 “Life below Water”

- ✓ to Improve Marine Science for the Sustainability of Living Ocean Resources
- ✓ AI in the conservation of oceans and marine life
- ✓ machine learning applications in oceanography
- ✓ Artificial intelligence for marine monitoring
- ✓ Experimental design and statistical analysis in aquatic live animal radiotracking studies

DEPARTMENT OF GEOINFORMATICS

Subject/ topic/ course in regular curriculum relating to SDG 1	• Geoinformatics For Hydrology • Groundwater and Watershed Management aspects of GIS. • water resources models • application of GIS in water quality monitoring, water resource planning and management and Hydrologic Information System • planning and development of water resources and methods to evaluatesurface water resources and groundwater, policies, and management. • Use of GIS for surface water modelling, groundwater modelling, and flood plain mapping. • Subsurface Water Exploration: Application of remote Sensing in hydro- geomorphological interpretation for groundwater exploration,
Cognitive Teaching & learning objectives	At the end of 2nd year the learner should be able to • The learner understands basic marine ecology, ecosystems, predator- prey relationships, etc. • understands the use of GIS Methodology to Measure Eutrophication Using Satellite Data • study information about chlorophyll and potential fishing zones usingGIS • The learner understands threats to ocean systems such as pollution and overfishing and recognizes and can explain the relative fragility of many ocean ecosystems, including coral reefs and hypoxic dead zones. • The learner knows about opportunities for the sustainable use of living marine resources.
Socio-emotional Teaching & learning objectives	At the end of final year the student should be able to • The learner understands basic marine ecology, ecosystems, preda- tor-prey relationships, etc. • understands the use of GIS Methodology to Measure Eutrophication Using Satellite Data • study information about chlorophyll and potential fishing zonesusing GIS • The learner understands threats to ocean systems such as pollutionand overfishing and recognizes and can explain the relative fragility of many ocean ecosystems, including coral reefs and hypoxic dead zones. • The learner knows about opportunities for the sustainable use of living marine resources.

Behavioural Teaching & learning objectives	At the end of the program the learner should be able to • research their country's dependence on the sea. • Debate sustainable methods such as strict fishing quotas and moratoriums on species in danger of extinction. • Able to identify, access, and buy sustainably harvested marine life, e.g. ecolabel certified products. Campaign for expanding no-fish zones and marine reserves and for their protection on a scientific basis.

Suggested topics for SDG 14 "Life Below Water."

- The hydrosphere: The water cycle, cloud formation, water as the great climate regulator
- Management and use of marine resources (renewables and non-renewables): global commons andoverfishing, quotas and how they are negotiated, aquaculture, seaweed, mineral resources using GIS
- GIS for Coral reefs, coasts, mangroves and their ecological importance
- GIS for Sea level rise and countries that will experience total or partial loss of land; climate refugees, and what a loss of sovereignty will mean
- The oceans and international law: international waters, territory disputes, flags of convenience and their related issues
- Remote Sensing is used for the study of ocean pollutants: plastics and microbeads.
- Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Examples of learning approaches and methods for SDG 14 "Life Below Water."

- Develop and run a (youth) action project related to life below water
- Conduct a case study about cultural and subsistent relationships to the sea in different countries. Conductlab experiments to provide students with evidence of ocean acidification
- Develop an inquiry-based project: "Do we need the ocean, or does the ocean need us?"

'Touching the lives of Millions'

Focusing on a purpose as expansive and yet as specific as improving quality of life through Human Development, the JSS Mahavidyapeetha has grown from strength to strength. A long and healthy life, Education for all and a decent standard of living, the indicators of Human development, have been the underlying philosophy of Jagadguru Sri Veerasimhasana Mahasamsthana Math, Suttur Srikshethra, for centuries. This is also the philosophy for which the Mahaidyapeetha today stands for.

Under the untiring efforts of Jagadguru Dr. Sri Shivarathri Rajendra Mahaswamiji, the Mahavidyapeetha has witnessed enormous growth in the field of education and today has over 300 institutions under its fold, from kindergartens to postgraduate centres and postdoctoral research catering to the educational needs of more than 1,00,000 students.

The Mahavidyapeetha continues to play an important role in expanding the scope of its activities to several branches of knowledge, welfare, and culture. Its educational efforts span crèches for toddlers of working rural women, schools to impart primary and secondary education in both Kannada and English medium, Colleges, Polytechnics, Technical, Medicine, etc. For realizing its mission, it has equipped itself with an extensive infrastructure and an army of dedicated and highly qualified human resource. These institutions, located in strategic areas, serve a broad spectrum of society, from virtually remote tribal villages to metropolitan cities such as Bengaluru, Noida, New Delhi, Ooty, and Coimbatore, besides their presence in United States, Mauritius, and Dubai.

Apart from formal education, the initiatives stretch to integrated rural development through training and empowering of rural folk, reaching out healthcare to people through modern and traditional Indian systems of medicine, patronizing literary activities, visual arts, performing arts, restoration of temples and historical monuments.

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