Department of Environmental Sciences

Education for Sustainable Development Goals

Teaching & Learning Objective Handbook

Education for

Sustainable Development Goals

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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.

FOREWORD

The Sustainable Development Goals (SDGs) introduced in the year 2015 is a follow up of the Millennium Development Goals (MDGs) implemented in 2000. It is a vital framework, which calls attention to meet the challenges towards creating a sustainable future with an impressive target of **"Leaving No One Behind"**. Achievement of SDGs calls for collective efforts of stakeholders from Government, Non-governmental organizations, Higher Educational Institutions, Multi-national agencies, Civilian organizations, and Public.

While the countries around the globe are seriously addressing several issues on the way towards achieving the SDGs, it is becoming evident that these goals cannot be achieved in complete if the younger generation are not made aware of the goals. The best possible means of reaching the youth is through the curriculum, either in schools or in universities. The United Nations has called upon the countries to incorporate the SGDs into the existing curriculum, aligning the teaching and learning aspects in line with the goals. JSS Academy of Higher Education & Research has emerged as a renowned institute in the country by providing quality education of highest standards through innovation in academic and research activities even during the most difficult times, for instance, the recent pandemic. JSS AHER has initiated the task of educating students and staff on the SDGs by incorporating the goals into the existing curriculum. Under the able guidance of the HEI, School of Life Sciences is committed to contribute towards achieving the SDGs through its multi-disciplinary academic excellence, research, innovation, environmental protection, and inclusiveness. Since its inception, the School of Life Sciences has seen an exponential growth in a short span of time due to the unique programs, which are being offered in five departments and eight divisions, keeping in mind the problems of the society. The School sees that most of the activities are closely aligned with the vision of sustainable development goals. The programs are designed to address the issues of the society pertaining to water, health, food and environment. The school stands today as a unique institution in the country known for multidisciplinary and interdisciplinary teaching and research in Life Sciences. We have attempted to identify potential courses that can be aligned to the tune of SDGs in the curriculum across the syllabi, which were recently revised according to the NEP 2020.

I take this opportunity to express my sincere gratitude to the leadership of JSS Academy of Higher Education & Research for their constant support and cooperation towards all our initiatives. I thank all the faculty members both teaching and non-teaching for having contributed towards a noble cause of achieving the SDGs through Education.

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PREFACE

The environment has always been the focus of sustainable development goals, where seven of them directly focused on the development of nature and natural resources. The Department of Environmental Sciences has taken serious note of it and is working on the betterment of nature and training the students on the same path. The syllabus is aligned to achieve and improve every aspect of nature and the betterment of human lives. The syllabus has oriented toward a hands-on approach with various case studies and laboratory practices which align students towards research and appreciation of the development.

The Department of Environmental Sciences focuses on the scientific aspect and works towards molding the student's mind to various aspects of environmental issues including humanities, art and management practices which changes the viewpoint towards environmental conservation and achieves most of UN sustainable development goals (UN SDGs). Students after studying this course can easily understand the importance of all sustainable development goals and simultaneously practice in day-to-day life to achieve overall development. All courses and course objectives contribute a lot towards the achievement of all the sustainable development goals directly and indirectly along with conservation of the environment. The department is working on the development of generation students with a similar mindset.

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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

UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS (SDGS)

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

SDG 1 – NO POVERTY

End poverty in all its forms everywhere

Teaching & Learning objectives for SDG 1 "No Poverty"

Course Name in curriculum relating to SDG 1	1. Environmental Awareness (ABC 01) 2. Natural Resource and Management (DSC 02) 3. Eco-Restoration and Development (DSC 11) 4. Environmental Impact Assessment (DSC 12) 5. Environmental Economics and Management (DSC 04)
Cognitive Teaching & learning objectives	• The learner understands the concepts of extreme and relative poverty and can critically reflect on their underlying cultural and normative assumptions and practices. • The learner knows about the local, national, and global distribution of extreme poverty and extreme wealth. • The learner knows about the causes and impacts of poverty such as unequal distribution of resources and power, colonization, conflicts, disasters caused by natural hazards and other climate change-induced impacts, environmental degradation and technological disasters, and the lack of social protection systems and measures. • The learner understands how extremes of poverty and extremes of wealth affect basic human rights and needs.
Socio-emotional Teaching & learning objectives	• The learner can collaborate with others to empower individuals and communities to affect change in the distribution of power and resources in the community and beyond. • The learner can raise awareness about extremes of poverty and wealth and encourage dialogue about solutions. • The learner can show sensitivity to the issues of poverty as well as empathy and solidarity with poor people and those in vulnerable situations.

Behavioral Teaching & learning objectives	• The learner can plan, implement, evaluate, and replicate activities that contribute to poverty reduction. • The learner can evaluate, participate in and influence decision-making concerning poverty generation and eradication. • The learner can include poverty reduction, social justice, and anti-corruption considerations in their consumption activities. • The learner can propose solutions to address systemic problems related to poverty.
Examples of learning approaches and methods for SDG 1 "No Poverty"	
• Develop partnerships between schools and universities in different regions of the country. • Plan and run an awareness campaign about poverty locally and globally • Plan and run a student company selling fair trade products • Plan and implement local service-learning and engagement opportunities for empowering poor people, reducing their vulnerability to different hazards and increasing their resilience – in collaboration with NGOs, the private sector and/or community groups, etc. • Conduct a case study on poverty and environmental wealth • Provide internships within organizations addressing socio-economic issues in connected to environmental quality • Develop an enquiry-based project around: "Is poverty increasing or decreasing?"	
SDG 1 "No Poverty" for students' workshop	
• Reason for global, national, and local distribution of extreme poverty and extreme wealth and environment case study • The interrelation of poverty, natural hazards, climate change and other economic, social, and environmental shocks and stresses – group exercise, debate, skits, etc. • Work conditions related to poverty such as, child labor and modern slavery in connection with natural resources – Case study • Consequences of poverty such as malnutrition, water and environmental quality, mortality, and violence - Essay & assignments • Policy frameworks at the local, national, and international levels, based on pro-poor and gender-sensitive, environmental development strategies	

SDG 2 - Zero Hunger

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

Teaching & Learning objectives for SDG 2 "Zero Hunger"

Course Name in curriculum relating to SDG 2	1. Natural Resources and Management (DSC 02) 2. Biodiversity Conservation and Management (DSC 05) 3. Water Energy and Food Nexus (DSE 04a)
Cognitive Teaching & learning objectives	• The learner knows about hunger, malnutrition, resource availability and their main physical and psychological effects on human life, and about specific vulnerable groups. • The learner knows about the amount and distribution of hunger and malnutrition locally, nationally, and globally, currently as well as historically. • The learner knows the main drivers and root causes of hunger at the individual, local, national, and global levels. • The learner understands the need for sustainable agriculture, environmental conservation, water quality, etc. to combat hunger and malnutrition worldwide and knows about other strategies to combat hunger, malnutrition, and water borne poor diets
Socio-emotional Teaching & learning objectives	• The learner can communicate the issues and connections between combating hunger and promoting sustainable agriculture resource and water management and improved nutrition. • The learner can create a vision for a world without hunger and malnutrition. • The learner can reflect on their own values and deal with diverging values, attitudes, and strategies in relation to combating hunger and malnutrition and promoting sustainable agriculture and water management.

	• The learner can feel empathy, responsibility, resource conservation, water management and solidarity for and with people suffering from hunger and malnutrition.
Behavioral Teaching & learning objectives	• The learner can evaluate and implement actions personally to combat hunger, promote sustainable agriculture and environmental management. • The learner can evaluate, participate in and influence decision-making related to hunger and malnutrition and the promotion of sustainable agriculture. • The learner can take on critically their role as an active global citizen in the challenge of combating hunger. • The learner can change their environmental management strategies and consumption practices to contribute to the combat against hunger and the promotion of sustainable agriculture and food production.
Suggested topics for SDG 2 "Zero Hunger"	
• Definition of the concept of hunger and malnutrition, water quality, water resource for food production • Groups that are particularly vulnerable to hunger and malnutrition in connection to climate change • Main drivers and root causes of hunger and malnutrition, including the relation between climate change and food security, water resources and the depletion of soil quality • Consequences of hunger and malnutrition on the health and well-being of people, including practices like migration as adaptation • Physical, emotional, and socio-cultural functions of food Hunger in relation to food abundance, obesity, and food waste • Global food – import, export, cash crops, international taxes, subsidies, trading systems, merits, risks, and challenges of utilizing genetically modified organisms • Institutions and movements related to hunger and sustainable agriculture like the UN's Food and Agriculture Organization (FAO), Food watch, Slow Food, community-based agriculture, the international movement Via Campesino, etc. • Concepts and principles of sustainable agriculture, including climate-resilient practices, organic farming, biodynamic farming, permaculture, and agro-forestry • Biodiversity of seeds, plants, and animals, particularly in relation to wild species	
Examples of learning approaches and methods for SDG 2 "Zero Hunger"	
• Perform role-plays with small-scale producers versus big enterprises in a global market	

- Carry out scenario development and analysis of local or national food production and consumption systems and/or about the impact of natural hazards and disasters in the food production systems
- Carry out case study analyses of adequate and non-adequate public policies or management strategies of enterprises to combat hunger, reduce food waste and promote sustainable agriculture
- Organize excursions and field trips to places where sustainable agriculture is practiced
- Follow food from farm to fork – growing, harvesting and preparing food, e.g. in urban or school gardening projects
- Engage students in efforts to connect leftover food with people in need "Conduct a Life"

SDG 3 - Good Health and Well-being

Ensure healthy lives and promote well-being for all at all ages

Teaching & Learning objectives for SDG 3 "Good Health & Wellbeing"

Course Name in curriculum relating to SDG 3	1. Environmental Pollution and Health (DSC 04) 2. Eco-toxicology (DSC 09) 3. Environmental Monitoring and Techniques (DSC 10)
Cognitive Teaching & learning objectives	• The learner knows conceptions of health, hygiene, water borne diseases, water and sanitation and well-being and can critically reflect on them, including an understanding of the importance of gender in health and well-being. • The learner knows facts and figures about the most severe communicable and non-communicable diseases, and the most vulnerable groups and regions concerning illness, disease, and premature death. • The learner understands the importance of environmental health. The learner understands the negative impacts of environmental pollution, climate change, contaminated water, etc. • The learner knows relevant prevention strategies to conservation and management of environment for good health and wellbeing.
Socio-emotional Teaching & learning objectives	• The learner can interact with people suffering from illnesses and feel empathy for their situation and feelings in connection with environmental quality and climate change consequences. • The learner can communicate about issues of environmental health, including waterborne diseases, heat shocks, etc. • The learner can encourage others to decide and act in favor of promoting health and well-being for all. • The learner can create a holistic understanding of a life of health and well-being, and clarify related values, beliefs, and attitudes. • The learner can develop a personal commitment to

	promoting health and well-being for themselves, their family, and others, including considering volunteer or professional work in environmental health and social care.
Behavioral Teaching & learning objectives	• The learner can include health-promoting behaviors in their daily routines. • The learner can plan, implement, evaluate, and replicate strategies that promote health, and well-being for themselves, their families, and others by improving the environmental quality. • The learner has the capacity to perceive when others need help and to seek help for themselves and others.
Suggested topics for SDG 3 "Good Health and Well-being"	
• Define: Severe communicable and non-communicable diseases which are influenced by climate change and environmental quality • Health problems of vulnerable groups and in the most vulnerable regions, and an understanding of how environmental quality may affect health and well-being • Direct strategies to promote health and well-being, e.g quality fresh water, healthy food without contamination, good environment, environmentally friendly practices, etc. • Indirect strategies (public health) to promote health and well-being: e.g transfer of knowledge and technology which are environmentally friendly, reduction of pollution and contamination • Philosophical and ethical conceptions of life quality, well-being, and happiness through environmentalism approaches • Overweight and obesity, insufficient physical activity, and unhealthy food due to environmental pollution • Chemicals, greenhouse gases, pollution and contamination of air, water, and soil	
Examples of learning approaches and methods for SDG 3 "Good Healthand Well-Being"	
• Set up an information stand in the city, e.g. on "world environment day, world water day", etc. • Watch videos that show health-promoting behaviors in connection with environment health and conservation • Participate in ethical, reflective essay writing and/or discussions about what a life of health and well-being means • Engage with storytelling by people with severe health impact through climate change and environmental contamination. • Organize training on health promotion and illness prevention strategies (e.g. participating in physical activities in ecosystem, preparing healthy food, detecting and managing sources of waterborne diseases) • Conduct projects on health consequences by climate change and	

contamination of ecosystem

- Develop an enquiry-based project, ‘Is living longer need quality environment?’

SDG 4 - Quality Education

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

Teaching & Learning objectives for SDG 4 "Quality Education"

Course Name in curriculum relating to SDG 4	1. Introduction to Environmental Science (DSC 01) 2. Environmental Issues (OEC 01) 3. Environmental Studies (ACE 01) 4. Environmental Awareness/ Educational Program (ABC 01)
Cognitive Teaching & learning objectives	• The learner understands the important role of environmental education and lifelong learning opportunities for all (formal, non-formal and informal learning) as main drivers of sustainable development, for improving people's lives and in achieving the SDGs. • The learner understands environmental education as a public good, a global common good, a fundamental human right and a basis for guaranteeing the realization of other rights. • The learner knows about inequality in access to and attainment of education, particularly requirement of environmental education and lifelong learning opportunities. • The learner understands the important role of culture in achieving sustainability and environmental conservation. • The learner understands that education can help create a more sustainable, equitable, eco-friendly practices and peaceful world.
Socio-emotional Teaching & learning objectives	• The learner can raise awareness of the importance of quality education for all, a humanistic and holistic approach to environmental education, and related approaches. • The learner is able through participatory methods to motivate and empower others to demand and use environmental educational opportunities and

	importance. • The learner can recognize the intrinsic value of education and to analyze and identify their own learning needs in their personal development in environmentally friendly and conservation practices. • The learner can recognize the importance of their own skills for improving their life, for employment and entrepreneurship.
Behavioral Teaching & learning objectives	• The learner can contribute to facilitating and implementing quality education for all and related approaches at different levels. • The learner can promote environmental conservation in education. • The learner can publicly demand and support the development of environmental policies promoting free, equitable and quality education for all, and related approaches as well as aiming at safe, accessible, and inclusive educational facilities. • The learner can promote the empowerment of young people. • The learner can use all opportunities for their own education throughout their life, and to apply the acquired knowledge in everyday situations to promote environment and sustainable development.

Suggested topics for SDG 4 "Quality Education"

- The Education 2030 agenda, and innovative and successful case studies from across the globe
- The relevance of inclusive and equitable quality education and lifelong learning opportunities for all (formal, non-formal and informal learning, including the use of ICT) and at all levels for improving people's lives and sustainable development
- Reasons for a lack of access to education (e.g. climate change, poverty, conflicts, disasters, gender inequality, lack of public financing of education, growing privatization)
- Global attainment of literacy, numeracy and basic skills
- Diversity and inclusive education
- Basic skills and competencies needed in the 21st century
- Environmental knowledge, values, skills and behaviors needed to promote sustainable development
- The concept of education for sustainable development, whole-institution approach as a key strategy to scale up education for sustainable development, and pedagogy for developing sustainability competencies
- Youth empowerment and empowerment of marginalized groups

Examples of learning approaches and methods for SDG 4 "Quality Education"
• Develop partnerships between schools, universities and other institutions offering environmental education in different regions of the world • Plan and run a quality education awareness campaign • Conduct a case study on the education system and access to education (e.g. enrolment in primary education) in selected communities or countries in connection with climate change and resource distribution • Plan and run a project at a school or university, or for the local community on quality education • Celebrate UN World Youth Skills Day, International Literacy Day, or World Teachers' Day; or take part in Global Action Week for Education • Organize ESD days at local, regional and national level

SDG 6 - Clean Water and Sanitation

Ensure availability and sustainable management of water and sanitation for all

Teaching & Learning objectives for SDG 6 "Clean Water and Sanitation"

Course Name in curriculum relating to SDG 6	1. Hydrology (DSE 01a) 2. Integrated Water resource Management (DSE 02a) 3. Water Supply and Sanitation (DSE 03a) 4. Water Energy and Food Nexus (DSE 04a)
Cognitive Teaching & learning objectives	• The learner understands water as a fundamental condition of life itself, the importance of water quality and quantity, and the causes, effects and consequences of water pollution and water scarcity. • The learner understands that water is part of many different complex global interrelationships and systems. • The learner knows about the global unequal distribution of access to safe drinking water and sanitation facilities. • The learner understands the concept of Integrated Water Resources Management (IWRM) and improved water reclamation strategies for ensuring the availability and sustainable management of water and sanitation, including flood and drought risk management. • The learners understand the source of contaminations including point and non-point sources
Socio-emotional Teaching & learning objectives	• The learner can participate in education and awareness activities of improving water and sanitation management in local communities. • The learner can communicate about water pollution, water access and water-saving measures and to create visibility about success stories. • The learner can feel responsible for their water use. • The learner can see the value in good sanitation and hygiene standards. • The learner can question socio-economic

	differences as well as gender disparities in the access to safe drinking water and sanitation facilities.
Behavioral Teaching & learning objectives	• The learner can cooperate with local authorities in the improvement of local capacity for self-sufficiency. • The learner can contribute to water resources management at the local level. • The learner can reduce their individual water footprint and to save water by practicing their daily habits. • The learner can plan, implement, evaluate, and replicate activities that contribute to increased water quality and safety. • The learner can evaluate, participate in and influence decision-making on management strategies of local, national, and international enterprises related to water pollution.

Suggested topics for SDG 6 "Clean Water and Sanitation"

- The global water cycle, water and sanitation and water distribution
- The importance of equitable access to safe and affordable drinking water (achieving water security under climate change: e.g. coping with social and economic pressure caused by frequent waves of droughts and hence water shortages, and by floods and hence too much water)
- The importance of adequate and equitable sanitation and hygiene, water quality and quantity parameters for health
- The human right to water and water as a global common goods
- Impacts of pollution, dumping and release of hazardous chemicals and materials on water quality water scarcity and water use efficiency
- Importance of water conservation-related ecosystems
- Water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies, water patents, landscaping for groundwater recharge as well as integrated water resources management
- Water and sustainable development (e.g. water and gender, water and inequality, water and health, water and cities, water and energy, water and food security, water and disaster risk reduction, water and climate change, water and the green economy, water and jobs)
- Plan and run an awareness campaign about water conservation and management locally and globally
- Plan and implement local service-learning and engagement opportunities for empowering poor people, reducing their vulnerability to different hazards and increasing their resilience to access fresh water in collaboration with NGOs, the private sector, community groups, etc.
- Conduct a case study on freshwater and sanitation in selected countries (through

desktop research) or at the local level (through excursions, doing interviews, etc.)

- Provide internships within organizations addressing water issues and freshwater distribution
- Develop an enquiry-based project around: “Is water required for healthy livelihood?”

Examples of learning approaches and methods for SDG 6 “Clean Water and Sanitation”

- Calculate one’s own water footprint (WF)
- Develop a concept for local sustainable water use and supply based on success stories
- Develop school partnerships between schools in regions with abundance or scarcity of water
- Organize excursions and field trips to local water infrastructures, and monitor water quality at school and home
- Plan and run an awareness campaign or youth action project on water and its importance
- Develop a project work on the invisible water, e.g. how much water in a liter of beer, a kilo of beef, a T shirt, etc.
- Develop an enquiry-based project: “What human activity can happen without water?”
- Develop safe and low-cost water treatment techniques for freshwater access by all

SDG 7 - Affordable and Clean Energy

Ensure access to affordable, reliable, sustainable, and clean energy for all

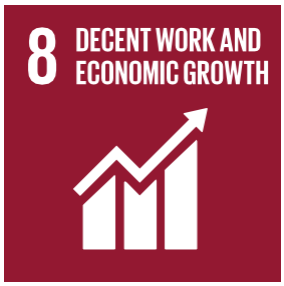
Teaching & Learning objectives for SDG 7 "Affordable and Clean Energy"

Course Name in curriculum relating to SDG 7	1. Natural Resources and Management (DSC 03) 2. Energy and Environment (DSC 06) 3. Bioenergy Technologies (DSC 07)
Cognitive Teaching & learning objectives	• The learner knows about different energy resources – renewable and non-renewable – and their respective advantages and disadvantages including environmental impacts, health issues, usage, safety and energy security, and their share in the energy mix at the local, national, and global level. • The learner understands the concept of energy efficiency and sufficiency and knows socio-technical strategies and policies to achieve efficiency and sufficiency. • The learner understands how policies can influence the development of energy production, supply, demand, and usage. • The learner knows about harmful impacts of unsustainable energy production, understands how renewable energy technologies can help to drive sustainable development and understands the need for new and innovative technologies and especially technology transfer in collaborations between countries. • The learners understand the development of renewable energy promoting policies, designing of renewable and alternative energy sources, management sources, etc.
Socio-emotional Teaching & learning objectives	• The learner can communicate the need for energy efficiency and sufficiency. • The learner can assess and understand the need for affordable, reliable, sustainable, and clean energy. • The learner can cooperate and collaborate with others to transfer and adapt energy technologies to different

	contexts and to share energy best practices of their communities. • The learner can clarify personal norms and values related to energy production and usage as well as to reflect and evaluate their own energy usage in terms of efficiency and sufficiency. • The learner can develop a vision of a reliable, sustainable energy production, supply, and usage in their country.
Behavioral Teaching & learning objectives	• The learner can apply and evaluate measures to increase energy efficiency and sufficiency in their personal sphere and to increase the share of renewable energy in their local energy mix. • The learner can apply basic principles to determine the most appropriate renewable energy strategy in each situation. • The learner can influence public policies related to energy production, supply, and usage. • The learner can compare and assess different business models and their suitability for different energy solutions and to influence energy suppliers to produce safe, reliable, and sustainable energy.
Suggested topics for SDG 7 "Affordable and Clean Energy"	
• Different energy types, especially renewable energies like solar, wind, water, geothermal, tidal Energy production, supply, demand, and usage of different countries • Energy efficiency and sufficiency in energy usage • Strategies: Centralized versus decentralized energy production; energy self-sufficiency, e.g. via local energy supply companies (LESCOs) • Political, economic and social dimensions of energy and linkages to power constellations, e.g. in mega energy projects like large scale solar farms or dam projects – potential conflict of interests (political and economic power (across borders), rights of especially indigenous people) • Environmental impacts and issues of energy production, supply and usage (e.g. climate change, grey energy) • The role of the public and private sectors in ensuring the development of low carbon energy solutions Peak of oil production and energy security – (over)dependence on non-renewable energies like oil Bridging technologies and technology for a 'cleaner' use of fossil fuels • Climate change related to energy production, supply, and usage	
Examples of learning approaches and methods for SDG 7 "Affordableand Clean Energy"	
• Experiment with renewable energy technologies • Reflect on and discuss own energy usage, e.g. ranking reasons for energy usage on a (subjective) dimension of "for fulfilling basic needs" (e.g. energy for cooking) to	

"for a luxury lifestyle" (e.g. energy for a swimming pool)

- Organize excursions to energy sites including ethical discussions with pros and cons of energy types and projects
- Conduct scenario analyses for future energy production, supply, and usage
- Conduct an energy saving campaign in one's own institution or at the local level
- Run a group project on how much energy is required to produce our daily needs, e.g. loaf of bread, cereal, etc.



SDG 8 - Decent Work and Economic Growth

Promote sustained inclusive and sustainable economic growth, full and productive employment, and decent work for all

Teaching & Learning objectives for SDG 8 "Decent Work and Economic Growth"

Course Name in curriculum relating to SDG 8	1. Ecotourism (OEC 03) 2. Environmental Economics and Management (DSC 05)
Cognitive Teaching & learning objectives	• The learner understands the concepts of environmental economics, role of EMS in sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work, including the advancement of gender parity and equality, and knows about alternative economic models and indicators. • The learner has knowledge about the distribution of formal employment rates per sector, informal employment, and unemployment in different world regions or nations, and which social groups are especially affected by unemployment. • The learner understands the relation between employment and economic growth and knows about other moderating factors like a growing labor force or new technologies that substitute jobs. • The learner understands how innovation, entrepreneurship and new job creation can contribute to decent work and a sustainability-driven economy and to the decoupling of economic growth from the impacts of natural hazards and environmental degradation.
Socio-emotional Teaching & learning objectives	• The learner can discuss economic models and future visions of the economy and society critically and to communicate them in public spheres. • The learner can collaborate with others to demand fair wages, equal pay for equal work and labor rights from politicians and from their employer. • The learner can understand how one's own consumption affects working conditions of others in

	the global economy. • The learner can identify their individual rights and clarify their needs and values related to work. • The learner can develop a vision and plans for their own economic life based on an analysis of their competencies and contexts.
Behavioral Teaching & learning objectives	• The learner can engage with new visions and models of a sustainable, inclusive economy and decent work. • The learner can facilitate improvements related to unfair wages, unequal pay for equal work and bad working conditions. • The learner can develop and evaluate ideas for sustainability-driven innovation, EMS and entrepreneurship. • The learner can plan and implement entrepreneurial projects. • The learner can develop criteria and make responsible consumption choices to support fair working conditions and efforts to decouple production from the impact of natural hazards and environmental degradation.

Suggested topics for SDG 8 "Decent Work and Economic Growth"

- The contributions of environment to economies and the social and individual effects of unemployment
- Environmental economic and management
- Theoretical assumptions, cost-benefit models, and indicators of economic growth
- Alternative economic models and indicators: circular economy, recycled economy
- Concepts and phenomena in financial systems and their influence on economic development.
- Environmental economics and green
- Inequalities in the labor market: representation and participation of different social groups, and different income/wages and weekly worktime between countries, sectors, social groups, genders
- Formal and informal labor, labor rights, especially for migrants and refugees, forced labor, slavery, and human trafficking
- Entrepreneurship, (social) innovation, new technologies and local economies for sustainable development

Examples of learning approaches and methods for SDG 8 "Decent Work and Economic Growth"

- Plan and implement entrepreneurial and environmental projects for promoting economic activities
- Student internships in connection with environmental strategies to improve businesses and economic developments
- Explore possibility for green practices and conservation of resources
- Engage with employers in classroom activities that promote green practices.

SDG 9 - Industry, Innovation, and Infrastructure

Build infrastructure, promote inclusive and sustainable industrialization and foster innovation

Teaching & Learning objectives for SDG 9 "Industry, Innovation and Infrastructure"

Course Name in curriculum relating to SDG 9	1. Environmental Earth Science (DSC 08) 2. Environmental Disaster Management (DSC 12) 3. Evolutionary Biology (DSC 15) 4. Environmental Chemistry (DSC 17) 5. Catalysis for Environmental Applications (DSE 2a)
Cognitive Teaching & learning objectives	• The learner understands the concepts of sustainable infrastructure and industrialization and society's needs for a systemic approach to their development. • The learner understands the local, national, and global challenges and conflicts in achieving sustainability in infrastructure and industrialization. • The learner knows the pitfalls of unsustainable industrialization and in contrast knows examples of resilient, inclusive, sustainable industrial development and the need for contingency planning. • The learner is aware of new opportunities and markets for sustainability innovation, resilient infrastructure, and industrial development.
Socio-emotional Teaching & learning objectives	• The learner can argue for sustainable, resilient, and inclusive infrastructure in their local area. • The learner can encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms. • The learner can find collaborators to develop sustainable and contextual industries that respond to our shifting challenges and to reach new markets. • The learner can recognize and reflect on their own personal demands on the local infrastructure such as their carbon and water footprints and food miles. • The learner can understand that with changing resource availability and other external shocks and

	stresses (e. g. natural hazards, conflicts) their own perspective and demands on infrastructure may need to shift radically regarding availability of renewable energy for ICT, transport options, sanitation options, etc.
Behavioral Teaching & learning objectives	• The learner can identify opportunities in their own culture and nation for greener and more resilient approaches to infrastructure, understanding their overall benefits for societies, especially about disaster risk reduction. • The learner can evaluate various forms of industrialization and compare their resilience. • The learner can access financial services such as loans or microfinance to support their own enterprises. • The learner can work with decision-makers to improve the uptake of sustainable infrastructure (including internet access).

Suggested topics for SDG 9 "Industry, Innovation and Infrastructure"

- The sustainability of information and communication technology (ICT) including supply chains, waste disposal and recycling
- The relation of quality infrastructure and the achievement of social, economic, and political goals
- The need for basic infrastructure like roads, information and communication technologies, sanitation, electrical power and water
- Inclusive and sustainable innovation and industrialization Sustainable and resilient infrastructure development
- Sustainable electricity: national grids, feed-in tariffs, expanding sustainable renewable sources, conflicts
- The sustainable job market, opportunities, and investments
- The sustainability of the internet – from green chat groups to the ecological footprint of search-engine servers
- The sustainability of transport infrastructure
- Alternative currencies as investment in local infrastructure

Examples of learning approaches and methods for SDG 9 "Industry, Innovation and Infrastructure"

- Role-play a day without access to electricity
- Develop a business continuity plan for a local enterprise after the impact of a natural hazard Develop an energy descent action plan for your community
- Develop a vision for a world with fossil fuel free transport systems
- Develop a project exploring one form of either the physical or social infrastructure that underpins your community
- Engage students and young people in developing spaces for community get-togethers
- Develop an enquiry-based project: "Is all innovation good?"

SDG 10 - Reduced Inequalities

Reduce inequality within and among countries

Teaching & Learning objectives for SDG 10 "Reduced Inequalities"

Course Name in curriculum relating to SDG 10	1. Natural Resource Management (DSC 02) 2. Sustainable Development (OEC 04) 3. Environmental Economics and Management (DSC 18)
Cognitive Teaching & learning objectives	• The learner knows different dimensions of inequality, their interrelations, and applicable statistics. • The learner knows indicators that measure and describe inequalities and understands their relevance for decision-making. • The learner understands that inequality is a major driver for societal problems and individual dissatisfaction. • The learner understands local, national, and global processes that both promote and hinder equality (fiscal, wage, and social protection policies, corporate activities, etc.). • The learner understands ethical principles concerning equality and is aware of psychological processes that foster discriminative behavior and decision making.
Socio-emotional Teaching & learning objectives	• The learner can raise awareness about inequalities. • The learner can feel empathy for and to show solidarity with people who are discriminated against. • The learner can negotiate the rights of different groups based on shared values and ethical principles. • The learner becomes aware of inequalities in their surroundings as well as in the wider world and can recognize the problematic consequences. • The learner can maintain a vision of a just and equal world.
Behavioral Teaching & learning	• The learner can evaluate inequalities in their local environment in terms of quality (different dimensions,

objectives	qualitative impact on individuals) and quantity (indicators, quantitative impact on individuals). • The learner can identify or develop an objective indicator to compare different groups, nations, etc. with respect to inequalities. • The learner can identify and analyze different types of causes and reasons for inequalities. • The learner can plan, implement, and evaluate strategies to reduce inequalities. • The learner can engage in the development of public policies and corporate activities that reduce inequalities

Suggested topics for SDG 10 "Reduced Inequalities"

- Social, economic, and political inclusion versus inequalities (on national and global levels) – typical discriminatory categories
- Different indicators to measure inequality
- The meaning of rights to land, property and natural resources for equality and the impact of inequalities on vulnerabilities and capacities
- Fiscal, wage and social protection policies
- Global trade systems and regulations (including tax regimes)
- Labor standards
- Representation of different social groups/nations in governments/on boards of meaningful and powerful institutions
- The amount and effects of international development aid
- Historical roots of current inequalities (including the role of multinational companies) Migration and mobility of people

Examples of learning approaches and methods for SDG 10 "ReducedInequalities"

- Play simple distribution games to discuss psychological effects of unfair and unequal treatment or the exacerbation of the impacts of natural hazards on a community due to inequality
- Analyze the share of different social categories in the own institution
- Plan an awareness or political campaign directed at inequalities in global trading systems
- Analyze one's own personal history considering times where one was privileged or discriminated against
- Conduct interviews with people in vulnerability
- Develop a web page or a blog highlighting an understanding of the local migration and/or refugee situation
- Develop an enquiry-based project: "How does inequality influence people's happiness?"

SDG 11 - Sustainable Cities and Communities

Make cities and human settlements inclusive, safe, resilient, and sustainable

Teaching & Learning objectives for SDG 11 "Sustainable Cities and Communities"

Course Name in curriculum relating to SDG 11	1. Natural Resources Management (DSC 02) 2. Sustainable Development (OEC 04) 3. Integrated Water Resource Management (DSE 02) 4. Water Energy and Food Nexus (DSE 04a)
Cognitive Teaching & learning objectives	• The learner understands basic physical, social and psychological human needs and can identify how these needs are currently addressed in their own physical urban, peri-urban and rural settlements. • The learner can evaluate and compare the sustainability of their and other settlements' systems in meeting their needs particularly in the areas of food, energy, transport, water, safety, waste treatment, inclusion and accessibility, education, integration of green spaces and disaster risk reduction. • The learner understands the historical reasons for settlement patterns and while respecting cultural heritage, understands the need to find compromises to develop improved sustainable systems. • The learner knows the basic principles of sustainable planning and building and can identify opportunities for making their own area more sustainable and inclusive. • The learner understands the role of local decision-makers and participatory governance and the importance of representing a sustainable voice in planning and policy for their area.
Socio-emotional Teaching & learning objectives	• The learner can connect with and help community groups locally and online in developing a sustainable future vision of their community. • The learner can reflect on their region in the development of their own identity, understanding the

	roles that the natural, social and technical environments have had in building their identity and culture. • The learner can contextualize their needs within the needs of the greater surrounding ecosystems, both locally and globally, for more sustainable human settlements. • The learner can feel responsible for the environmental and social impacts of their own individual lifestyle.
Behavioral Teaching & learning objectives	• The learner can plan & participate in community-based sustainability projects. • The learner can participate in decision processes about their community. • The learner can co-create an inclusive, safe, resilient, and sustainable community. • The learner can promote low carbon approaches at the local level.

Suggested topics for SDG 11 "Sustainable Cities and Communities"

- The need for shelter, safety, and inclusiveness (human needs, contextualizing our different individual and collective wants and needs according to gender, age, income, and ability)
- Management and use of natural resources (renewables and non-renewables)
- Sustainable energy (residential energy use, renewable energies, community energy schemes) and transportation
- Sustainable food (agriculture, organic agriculture and permaculture, community supported agriculture, foodshed[8], food processing, dietary choices and habits, waste generation)
- Urban ecology and how wildlife is adapting to humanity's settlements
- Sustainable resilient buildings and spatial planning (building materials, energy saving, planning processes) Waste generation and management (prevention, reduction, recycling, reuse)
- Communities and their dynamics (decision-making, governance, planning, conflict resolution, alternative communities, healthy communities, inclusive communities, ecovillages, transition towns)
- Water cycle and restoring ground water through urban design (Green Roofs, rainwater harvesting, daylighting old riverbeds, sustainable urban drainage)
- Disaster preparedness and resilience, resilience to weather problems and in the future and a culture of prevention and preparedness.

Examples of learning approaches and methods for SDG 11 "Sustainable Citiesand Communities"

- Excursions to ecovillages and other "living laboratories", to wastewater treatment plants and other service centers to show current and best practice.
- Develop and run a (youth) action project on sustainable cities and communities.
- Invite older generations in to talk about how the settlement has changed over

time. Ask them about their connection to the bioregion. Use art, literature, and history to explore the settlement area and its changes.

- Build a community garden
- Mapping projects: map the area to note where there is good use of public open space, human scale planning, areas where the needs of the community are addressed, green spaces, etc. This can also map the areas that need to be improved, such as areas most exposed to natural hazards
- Develop a two-minute video clip on an example of a sustainable urban community Develop an enquiry-based project: “Would it be more sustainable if we all lived in cities?”

SDG 12 - Responsible Consumption and Production

Ensure sustainable consumption and production patterns

Teaching & Learning objectives for SDG 12 "Responsible Consumption and Production"

Course Name in curriculum relating to SDG 12	1. Biodiversity Conservation and Management (DSC 05) 2. Ecotourism (OEC 03) 3. Sustainable Development (OEC 04) 4. Wildlife Management and Conservation (DSC 14)
Cognitive Teaching & learning objectives	• The learner understands how individual lifestyle choices influence social, economic, and environmental resource conservation. • The learner understands production and consumption patterns and value chains and the interrelatedness of production and consumption (supply and demand, toxics, CO_2 emissions, waste generation, health, working conditions, poverty, etc.). • The learner knows roles, rights, and duties of different actors in production and consumption (media and advertising, enterprises, municipalities, legislation, consumers, etc.). • The learner knows about strategies and practices of sustainable production and consumption. • The learner understands dilemmas/trade-offs related to and system changes necessary for achieving sustainable consumption and production.
Socio-emotional Teaching & learning objectives	• The learner can communicate the need for sustainable practices in production and consumption. • The learner can encourage others to engage in sustainable practices in consumption and production. • The learner can differentiate between needs and wants and to reflect on their own individual consumer behavior considering the needs of the natural world, other people, cultures and countries, and future generations. • The learner can envision sustainable lifestyles.

	• The learner can feel responsible for the environmental and social impacts of their own individual behavior as a producer or consumer.
Behavioral Teaching & learning objectives	• The learner can plan, implement, and evaluate consumption-related activities using existing sustainability criteria. • The learner can evaluate, participate in and influence decision-making processes about acquisitions in the public sector. • The learner can promote sustainable production patterns. • The learner is able take on critically on their role as an active stakeholder in the market. • The learner can challenge cultural and societal orientations in consumption and production.
Suggested topics for SDG 12 "Responsible Consumption and Production"	
• Advertising, peer-pressure, belonging and identity-creation • Production and consumption history, patterns and value chains, and management and use of natural resources (renewables and non-renewables) • Environmental and social impacts of production and consumption • Energy production and consumption (transport, commercial and residential energy use, renewable energies) • Food production and consumption (agriculture, food processing, dietary choices and habits, waste generation, deforestation, overconsumption of food and hunger) • Tourism • Waste generation and management (prevention, reduction, recycling, reuse) Sustainable lifestyles and diverse practices of sustainable production and consumption Labelling systems and certificates for sustainable production and consumption • Green economy (cradle-to-cradle, circular economy, green growth, degrowth)	
Examples of learning approaches and methods for SDG 12 "ResponsibleConsumption and Production"	
• Calculate and reflect on one's individual ecological footprint • Analyze different products (e.g. cell phones, computers, clothes) using Life Cycle Analysis (LCA) Run a student company producing and selling sustainable products • Perform role plays dealing with different roles in a trading system (producer, advertiser, consumer, waste manager, etc.) • Screening of short films/documentaries to help the learners understand production and consumption patterns (e.g. *Story of Stuff* by Annie Leonard) • Develop and run a (youth) action project related to production and consumption (e.g. fashion, technology, etc.) Develop an enquiry-based project: "Is sustainability about giving things up?"	

SDG 13 - Climate Action

Take urgent action to combat climate change and its impacts

Teaching & Learning objectives for SDG 13 “Climate Action”

Course Name in curriculum relating to SDG 13	1. Introduction to Environmental Science (DSC 01) 2. Environmental Issues (OEC 01) 3. Atmospheric Science (DSE 01b) 4. Carbon Sequestration and Management (DSE 02b) 5. Climate Change and Management (DSE 04b)
Cognitive Teaching & learning objectives	• The learner understands the greenhouse effect as a natural phenomenon caused by an insulating layer of greenhouse gases. • The learner understands the current climate change as an anthropogenic phenomenon resulting from the increased greenhouse gas emissions. • The learner knows which human activities – on a global, national, local, and individual level – contribute most to climate change. • The learner knows about the main ecological, social, cultural, and economic consequences of climate change locally, nationally and globally and understands how these can themselves become catalyzing, reinforcing factors for climate change. • The learner knows about prevention, mitigation, and adaptation strategies at different levels (global to individual) and for different contexts and their connections with disaster response and disaster risk reduction.
Socio-emotional Teaching & learning objectives	• The learner can explain ecosystem dynamics and the environmental, social, economic, and ethical impact of climate change. • The learner can encourage others to protect the climate. • The learner can collaborate with others and to develop commonly agreed-upon strategies to deal

	with climate change. • The learner can understand their personal impact on the world's climate, from a local to a global perspective. • The learner can recognize that the protection of the global climate is an essential task for everyone and that we need to completely re-evaluate our worldview and everyday behaviors in light of this.
Behavioral Teaching & learning objectives	• The learner can evaluate whether their private and job activities are climate friendly and – where not – to revise them. • The learner can act in favor of people threatened by climate change. • The learner can anticipate, estimate, and assess the impact of personal, local and national decisions or activities on other people and world regions. • The learner can promote climate-protecting public policies. • The learner can support climate-friendly economic activities.

Suggested topics for SDG 13 "Climate Action"

- Source of greenhouse gases and their emission
- Energy, agriculture, and industry-related greenhouse gas emissions
- Climate change-related hazards leading to disasters like drought, weather extremes, etc. and their unequal social and economic impact within households, communities, and countries and between countries
- Sea-level rise and its consequences for countries (e.g., small island states) Migration and flight related to climate change
- Prevention, mitigation and adaptation strategies and their connections with disaster response and disaster risk reduction
- Local, national, and global institutions addressing issues of climate change
- Local, national, and global policy strategies to protect the climate
- Future scenarios (including alternative explanations for the global temperature rise) Effects of and impacts on big eco-systems like forests, oceans, glaciers, and biodiversity
- Environmental ethics and climate change

Examples of learning approaches and methods for SDG 13 "Climate Action"

- Perform a role-play to estimate and feel the impact of climate change related phenomena from different perspectives
- Analyze different climate change scenarios concerning their assumptions, consequences, and their preceding development paths
- Develop and run an action project or campaign related to climate protection
- Develop a web page or blog for group contributions related to climate change issues
- Develop climate friendly biographies and technology

- Develop a study case about how climate change could increase the risk of disasters in a local community
- Develop an enquiry-based project investigating the statement “Those who caused the most damage to the atmosphere should pay for it”

SDG 14 - Life below Water

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

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

Course Name in curriculum relating to SDG 14	1. Introduction to Environmental Science (DSC 01) 2. Natural Resource Management (DSC 03) 3. Environmental Studies (AECC 01) 4. Introduction to Environmental Microbiology (DSC 07) 5. Water and Wastewater Treatment (DSC 07) 6. Hydrology (DSE 01a) 7. Integrated Water Resource Management (DSE 02a) 8. Environmental Monitoring and Techniques (DSC 10) 9. Eco-restoration and Development (DSC 11) 10. Solid Waste Management (DSC 13) 11. Water Supply and Sanitation (DSE 03a) 12. Water Energy and Food Nexus (DSE 04a) 13. 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 Teaching & learning objectives	• The learner can research their dependence on the 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?"

SDG 15 - 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

Teaching & Learning objectives for SDG 15 "Life on Land"

Course Name in curriculum relating to SDG 15	1. Environmental Pollution and Health (DSC 04) 2. Introduction to Environmental Microbiology (DSC 07) 3. Sustainable Development (OEC 07) 4. Environmental Monitoring and Techniques (DSC 10) 5. Eco-restoration and Development (DSC 11) 6. Environmental Disaster Management (DSC 12) 7. Atmospheric Sciences (DSE 01b) 8. Carbon Sequestration and Management (DSE 02b) 9. Environmental Biology (DSC 16) 10. Environmental Impact Assessment (DSC 19) 11. Water and Energy and Food Nexus (DSE 04a)
Cognitive Teaching & learning objectives	• The learner understands basic ecology with reference to local and global ecosystems, identifying local species and understanding the measure of biodiversity. • The learner understands the manifold threats posed to biodiversity, including habitat loss, deforestation, fragmentation, overexploitation, and invasive species, and can relate these threats to their local biodiversity. • The learner understands the slow regeneration of soil and the multiple threats that are destroying and removing it much faster than it can replenish itself, such as poor farming or forestry practice. • The learner understands that realistic conservation strategies work outside pure nature reserves to also improve legislation, restore degraded habitats and soils, connect wildlife corridors, sustainable agriculture and forestry, and redress humanity's relationship to wildlife

Socio-emotional Teaching & learning objectives	• The learner can argue against destructive environmental practices that cause biodiversity loss. • The learner can connect with their local natural areas and feel empathy with non- human life on Earth. • The learner can question the dualism of human/nature and realizes that we are a part of nature and not apart from nature. • The learner can create a vision of a life in harmony with nature.
Behavioral Teaching & learning objectives	• The learner can connect with local groups working toward biodiversity conservation in their area. • The learner can effectively speak on topics related to permeable to wildlife through the establishment of wildlife corridors, agro-environmental schemes, restoration ecology and more. • The learner is able to highlight the importance of soil as our growing material for all food and the importance of remediating or stopping the erosion of our soils. • The learner can campaign and work for the implementation and development of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) regulations.
Suggested topics for SDG 15 "Life on Land"	
• Ecology: competition, predator-prey, community dynamics, energy flow through food webs, dispersal, and ranges. Specific ecosystems – local and global native ecosystems and also human-made ones, e.g. managed forestry plantations • Threats to biodiversity: habitat loss, deforestation, fragmentation, invasive species, and overexploitation (caused by unsustainable production and consumption practices, unsustainable technologies, etc.) • The dangers of extinction: Individually endangered species, how extinction is forever, the long time needed to form species, and the six mass extinctions • Restoration of wildlife and seeing humans as a healing force • Climate change and biodiversity, ecosystems as carbon sinks, disaster risk reduction and ecosystems (ecosystems as a natural barrier to natural hazards) • Soil and its formation and structure • Desertification, deforestation, and efforts to combat them • The human's connection with nature – the natural self • Ecosystem services (cultural, provisioning, regulatory and supporting) • Evolution and genetics, genetic resources, ethics	
Examples of learning approaches and methods for SDG 15 "Life on Land"	
• Map the local area, mark areas of various wildlife populations as well as barriers, such as dispersal barriers like roads and invasive species populations • Perform an annual day when the community comes together to map as many	

different species in their area as possible

- Run a composting workshop and show organic material formation
- Take an excursion to a nearby parkland for cultural purposes, e.g. recreation, meditation, art
- Plant a wildlife garden for wild animals, e.g. bee-friendly flowers, insect hotels, ponds, etc. in urban areas Celebrate Earth Day and/or World Environment Day
- Develop an enquiry-based project: “Why is biodiversity important?”

SDG 17 - Partnerships for the Goals

Strengthen the implementation and revitalize the global partnership for sustainable development

Teaching & Learning objectives for SDG 17 "Partnerships for the Goals"

Course Name in curriculum relating to SDG 17	• Biodiversity conservation and Management (DSC 02) • Environmental Issues (OEC 01) • Sustainable Development (OEC 07) • Wildlife Sciences (OEC 2) • Wildlife Conservation and Management (DSC 14)
Cognitive Teaching & learning objectives	• The learner understands global environmental issues, including issues of financing for development, taxation, environmental and economics, debt and trade policies, and the interconnectedness and interdependency of different countries and populations. • The learner understands the importance of global multi-stakeholder partnerships and the shared accountability for sustainable development and knows examples of networks, institutions, campaigns of global partnerships. • The learner knows the concepts of global governance and global citizenship. • The learner recognizes the importance of cooperation on and access to science, technology and innovation, and knowledge sharing. • The learner knows concepts for measuring progress on sustainable development.
Socio-emotional Teaching & learning objectives	• The learner can raise awareness about the importance of global partnerships for sustainable development. • The learner can work with others to promote global partnerships for sustainable development and demand governments' accountability for the SDGs. • The learner can take ownership of the SDGs. • The learner can create a vision for a sustainable global society.

	• The learner can experience a sense of belonging to a common humanity, sharing values and responsibilities, based on human rights.
Behavioral Teaching & learning objectives	• The learner can become a change agent to realize the SDGs and to take on their role as an active, critical, and global and sustainability citizen. • The learner can contribute to facilitating and implementing local, national, and global partnerships for sustainable development. • The learner can publicly demand and support the development of policies promoting global partnerships for sustainable development. • The learner can support development cooperation activities. • The learner can influence companies to become part of global partnerships for sustainable development.

Suggested topics for SDG 17 "Partnerships for the Goals"

- Global partnerships between governments, the private sector and civil society for sustainable development, their shared accountability, and possible conflicts between the different actors
- Local, national, and global systems, structures and power dynamics
- Global governance and policies and the global market and trading system in the light of sustainable development
- The prisoner's dilemma and tragedy of the commons as challenges for creating global governance, climate change and markets promoting sustainable development
- Global citizenship and citizens as change agents for sustainable development
- Cooperation on and access to science, technology and innovation, and knowledge sharing
- Global distribution of access to the internet
- Development cooperation, development assistance, and additional financial resources for developing countries from multiple sources
- Capacity-building to support national plans to implement all the SDGs Measurements of progress on sustainable development

Examples of learning approaches and methods for SDG 17 "Partnerships forthe Goals"

- Develop partnerships or global web-based distance education experiences between schools, universities, or other institutions in different regions of the world
- Analyze the development and implementation of global policies on climate change, biodiversity, etc.
- Analyze the progress in implementing the SDGs globally and at the national level, and determine who is accountable for progress or lack thereof
- Plan and implement an SDGs awareness campaign
- Perform simulation games related to global conference negotiations (climate change mitigation, carbon footprint, etc.) Plan and run a (youth) action project

on the SDGs and their importance

- Develop an enquiry-based project: “Together we can…. Explore this commonly used phrase and how it applies to the SDGs”

CONCLUSIONS

Institution & individual can contribute to achieving the UN sustainable development goals by developing cross-cutting sustainability competencies that are needed to deal with many different sustainability challenges and to relate the different SDGs to each other. Institution can equip learners with the specific cognitive, socio-emotional, and behavioral learning outcomes that enable them to deal with the challenges of each SDG.

To make it possible for everyone around the world to act in favor of the SDGs, all educational institutions must consider it their responsibility to deal intensively with sustainable development issues, to foster the development of sustainability competencies and to develop the specific learning outcomes related to all SDGs. Therefore, it is vital not only to include SDG-related contents in the curricula, but also to use action-oriented transformative pedagogy.

Education officials, policymakers, educators, curriculum developers and others are called upon to rethink education to contribute to the achievement of the SDGs within their timeframe, between now and 2030. This guidance provides an orientation to the sustainability competencies and specific cognitive, socio-emotional, and behavioral learning outcomes that are relevant to this goal, and it outlines what is needed to implement learning for the SDGs through Educational Institutions.

Education for Sustainable Development Goals - Teaching & Learning Objectives

To create a more sustainable world and to engage with issues related to sustainability as described in the Sustainable Development Goals (SDGs), individuals must become sustainability change-makers. They require the knowledge, skills, values, and attitudes that empower them to contribute to sustainable development. Education is thus crucial for the achievement of sustainable development, and Education for Sustainable Development is particularly needed because it empowers learners to take informed decisions and act responsibly for environmental integrity, economic viability and a just society, for present and future generations.

This handbook guides readers on how to use education, especially to achieve the SDGs. It identifies teaching & learning objectives of Environmental Science programs at UG and PG level and suggests topics including learning activities of all course/subjects introduced for each SDG. Also, it describes implementation at different levels from course design to national strategies. The document aims to support policymakers, curriculum developers and educators in designing strategies, curricula and courses to promote learning for the SDGs.

Key elements for whole-institutionapproaches

- An institution-wide process that enables all stakeholders, leadership, teachers, learners, administration – to jointly develop a vision and plan to implement ESD in the whole institution.
- Technical and financial support to the institution to support its reorientation, including for instance the provision of relevant good practice examples, training for leadership and administration, the development of guidelines and associated research.
- Inter-institutional networks that facilitate mutual support such as peer-to-peer learning on a whole-institution approach, and increase the visibility of the approach to promote it as a model for adaptation.

Learning objectives for teachers to promote SDG

- Know about sustainable development, the different SDGs and the related topics and challenges
- Understand the discourse on and the practice of in local, national, and global context
- Develop their own integrative view of the issues and challenges of sustainable development by considering the social, ecological, economic, and cultural dimensions from the perspective of the principles and values of sustainable development, including that of intergenerational and global justice
- Take disciplinary, interdisciplinary, and transdisciplinary perspectives on issues of global change and their local manifestations
- Reflect on the concept of sustainable development, the challenges in achieving the SGDs, the importance of their own field of expertise for achieving the SDGs and their own role in this process
- Understand how cultural diversity, gender equality, social justice, environmental protection and personal
- development are integral elements of ESD and how to make them a part of educational processes
- Practice an action-oriented transformative pedagogy that engages learners in participative, systemic, creative, and innovative thinking and acting processes in the context of local communities and learners' daily lives
- Act as a change agent in a process of organizational learning that advances their school towards sustainable development
- Identify local learning opportunities related to sustainable development and build cooperative relationships
- Evaluate and assess the learners' development of cross-cutting sustainability competencies and specific sustainability-related learning outcomes

Key learning methods for SDGs

- Collaborative real-world projects, such as service-learning projects and campaigns for different SDGs.
- Vision building exercises such as future workshops, scenario analysis, utopian/dystopian storytelling, science-fiction thinking and forecasting and back casting.

- Analyses of complex systems through community-based research projects, cases studies, stakeholder analysis, actors' analysis, modelling, systems games, etc.
- Critical and reflective thinking through fishbowl discussions, reflective journals, etc.

Collaborative real-world projects, such as service-learning projects and campaigns for different SDGs.

Vision building exercises such as future workshops, scenario analysis, utopian/dystopian storytelling, science-fiction thinking and forecasting and back casting.

Analyses of complex systems through community-based research projects, cases studies, stakeholder analysis, actors' analysis, modelling, systems games, etc.

Critical and reflective thinking through fishbowl discussions, reflective journals, etc.

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'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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