# 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-9- Industry, Innovation, and Infrastructure

**2024**

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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.

**Dr.B.Suresh**
**Pro Chancellor**
**JSS Academy of Higher Education & Research, Mysuru &**
**President, Pharmacy Council of India**
**New Delhi**

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.

Souíce: **l'he Sustainable Development Goals Repoít 2022**

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

Access to Learning objectives for SDG-9

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 prosperitywhile protecting the planet to achieve sustainable development. Thus, with respect to the SDGs, all countriescan 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

# TEACHING & LEARNING OBJECTIVES FOR SDG 9
# JSS MEDICAL COLLEGE & HOSPITAL

## 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"**

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| Subject/ topic/ course in regular curriculum relating to SDG -2 | Anatomy, Physiology, Biochemistry, Pharmacology, Community Medicine, Forensic Medicine, General Surgery, Paediatrics, Anaesthesia, EMD and OBG |
| Cognitive<br>Teaching & learning objectives | **At the end of 1st Professional year the learner should be able to,**<br>• Describe the embalming and plastination techniques<br>• Discuss conduction of human experiments and animal experiments with computer assisted learning<br>**At the end of 3rd Professional year part 1, the learner should be able to,**<br>• Describe and discuss Ethical Guidelines for Biomedical Research on Human Subjects & Animals<br>• Discuss human experimentation including clinical trials<br>• Describe the importance and advantages of simulated environments like mannequins in learning surgical skills and procedures<br>• Describe classification of hospital waste and appropriate methods of disposal. |

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| | • Define cold chain and discuss the methods of safe storage and handling of vaccines<br>• Enumerate recent investigation techniques in diagnosis of various illnesses<br>• Describe the concepts in disaster management<br>• Describe and demonstrate the application of computers in epidemiology<br>• Describe the principles of management of information systems<br>• Discuss health problems among people in different occupational settings including ergonomics<br>• Describe the role, benefits and functioning of the employees state insurance scheme |
| Socio-emotional<br>Teaching & learning objectives | **At the end of final year the learner should be able to**<br>• Communicate and counsel patients and families on the outcome and rehabilitation demonstrating empathy and care.<br>• Can feel empathy, responsibility and solidarity for and with people suffering from disaster<br>• Can observe and reflect on the implementation of the program by visiting the Rural Health Centre<br>• Identify various issues during outbreaks and their prevention |
| Behavioural<br>Teaching & learning objectives | **At the end of final year the learner should be able to**<br>• Perform basic clinical examination in simulated environment/ mannequins<br>• Perform basic surgical Skills such as First aid including suturing, I.V. access, bladder catheterization, endotracheal intubation, Splintage, demonstrate the stages of normal labor etc in simulated environment like mannequins<br>• Demonstrate the steps in Basic Life Support and Advanced cardiac life support in adults and children using mannequins<br>• Demonstrate the use of learning management system<br>• Demonstrate the application of computers in epidemiology<br>• Observe, demonstrate and interpret human experiments and animal experiments with computer assisted learning<br>• Demonstrate ability to use local resources whenever required like in mass disaster situations<br>• Formulate a research question for a study and demonstrate ability to conduct research in pursuance to guidelines or research ethics |

## Topics for SDG 9 "Industry, Innovation and Infrastructure"

- Plastination techniques
- Molecular biology and genetics
- Novel drug delivery systems and drug development
- Conduct health education sessions and counselling at community setting on management of disaster with available sustainable resources
- Development of vaccines and the phases of vaccine trials
- ICH-GCP, GLP, GEP
- Describe the details of the National Disaster management Authority
    - Describe Socioeconomic factors influencing infrastructure and innovation.
- Research Methodology and bio-statistics
- Impact of new technologies and quality infrastructure on economic growth and social development
- Local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization
- Basic life support and advanced cardiac life support using mannequins
- E learning
- Occupational health

## Learning approaches and methods for SDG 9 "Industry, Innovation and Infrastructure"

- Demonstration on disaster management with limited resources at community settings
- Conduction of research fair to share innovative research ideas
- Role play on the effect of non availability of internet access and technology in learning
- Poster competition and essay writing on the methods of using renewable resources and sustainable products in order to preserve natural resources, disaster risk reduction, fossil fuel free transport systems etc.
- Visit to Centre of Excellence in Molecular biology and Regenerative Medicine to understand innovations in basic research and laboratory infrastructure to conduct molecular research
- Visit to CDSA- Centre of clinical research excellence to understand the clinical research and vaccine trials
- Visit to central animal house to understand drug discovery and testing
- Provide platform to discuss on modification of the education system to stimulate the creation of ideas and projects
- Guide and encourage students to apply research projects for funds at various funding agencies

# TEACHING & LEARNING OBJECTIVES FOR SDG 9
# JSS DENTAL COLLEGE & HOSPITAL

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| Subject/ topic/ course in regular curriculum relating to SDG 9 | • Dental Manpower planning<br>• Industrial consultation/collaboration<br>• IPR<br>• Public Private Partnership in Oral health care delivery | • All specialties in Dentistry<br>• All undergraduate and post graduate students |
| Cognitive<br>Teaching & learning objectives | • The learner understands the concepts of sustainable infrastructure and industrialization and society's needs for a systemic approach to their development.<br>• The learner understands the local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization.<br>• 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.<br>• The learner is aware of new opportunities and markets for sustainability innovation, resilient infrastructure and industrial development. | |
| Socio-emotional<br>Teaching & learning objectives | • The learner can argue for sustainable, resilient and inclusive infrastructure in their local area.<br>• The learner can encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms.<br>• The learner can find collaborators to develop sustainable and contextual industries that respond to our shifting challenges and to reach new markets.<br>• 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.<br>• 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. | |
| Behavioural<br>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 with regard to disaster risk reduction.<br>• The learner can evaluate various forms of industrialization and compare their resilience.<br>• The learner is able to access financial services such as loans or microfinance to support their own enterprises.<br>• 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, Innovationand 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?"

# TEACHING & LEARNING OBJECTIVES FOR SDG 9
# JSS COLLEGE OF PHARMACY, MYSORE

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| Subject/ topic/ course in regular curriculum relating to SDG 9 | • Pharmaceutics, Human Anatomy & Physiology, Biochemistry, Pharmacology, Industrial pharmacy-I, Cosmeceuticals, Instrumental method of analysis, Microbiology and Biotechnology, Pharmaceutical Engineering |
| Cognitive<br>Teaching & learning objectives | **At the end of 1st Professional year, the learner should be able to,**<br>• Describe and explain preparation of dosage forms<br>• Discuss conduction of experiments on quantification of drug substances<br>• Describe classification of dosage forms and route of administration.<br>• Define and discuss the methods of storage various dosage forms<br>• Describe the applications of computer in pharmacy<br><br>**At the end of 2nd Professional year, the learner should be able to,**<br>• Enumerate recent advancement in drug delivery and their evaluation<br>• Describe the techniques to Improve the solubility of drugs<br>• Demonstrate the use of physicochemical properties of drugs in the formulation development<br>• Describe the sterility testing methods of pharmaceutical products<br>• Demonstrate unit operations in the pharma industries<br>• Describe the preparation of organic compounds<br>• Describe the Structural Activity relationship of various drugs<br>• Describe the evaluation techniques for herbal drugs<br><br>**At the end of 3rd Professional year, the learner should be able to,**<br>• Describe the quality control tests for various dosage forms<br>• Describe and demonstrate the manufacturing techniques of dosage forms<br>• Discuss the pharmaceutical legislation and their implications<br>• Describe the chemistry of drugs and their biological activity<br>• Describe the concepts of pharmacokinetics and pharmacodynamics of drugs<br>• Describe the method of preparation vaccines and their storage<br>• Describe the cGMP aspects of pharmaceutical Industries<br><br>**At the end of 4th Professional year, the learner should be able to,**<br>• Describe the chromatographic techniques for separation and drug analysis<br>• Describe the technology transfer and commercialization<br>• Discuss the therapeutic drug monitoring of patients<br>• Describe the pharmaceutical care services, patient counselling and interpret |

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| | laboratory results<br>• Describe the various approaches for development of novel drug delivery systems<br>• Demonstrate the statistical techniques to solve the problems |
| Socio-emotional Teaching & learning objectives | **At the end of final year, the learner should be able to**<br>• Effective communication and counselling the patients and their families on the safe use of drugs and care.<br>• Can feel responsibility and solidarity for patients<br>• Identify route for development of cost-effective dosage |
| Behavioural Teaching & learning objectives | **At the end of final year, the learner should be able to**<br>• Perform basic pre-clinical examination in simulated environment/ mannequins<br>• Perform and demonstrate the various analytical techniques<br>• Formulate stable, economical and safe dosage forms<br>• Demonstrate the use of learning management system<br>• Demonstrate the application of computers in drug delivery systems<br>• Observe, demonstrate and interpret animal experiments with computer assisted learning<br>• Formulate a research question for a study and demonstrate ability to conduct research in pursuance to guidelines or research ethics |

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

- Molecular biology and genetics
- Synthesis of novel compounds
- Evaluation techniques like GC, HPLC etc.
- Novel drug delivery systems and drug development
- Development of vaccines and the phases of vaccine trials
- ICH-GCP, GLP, GMP
- Research Methodology and bio-statistics
- Local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization
- E learning
- Setting up of small scale pharmaceutical industries .

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

- Demonstration on handling of analytical instruments and equipment
- Conduction of seminars, conferences to share innovative research ideas
- Poster competition and essay writing on the methods of using renewable resources and sustainable products in order to preserve natural resources, disaster risk reduction, fossil fuel free transport systems etc.
- Visit to Centre of Excellence in nanotechnology to understand innovations in research and laboratory infrastructure to conduct drug development research activities in the field of nanotechnology
- Visit to central animal house to understand drug discovery and pre-clinical testing
- Guide and encourage students to apply research projects for funds at various government and non-government funding agencies
- Visit to pharmaceutical industries to understand basic infrastructure, regulations/guidelines and recent advancements on drug development among experts working in pharmaceutical industries.

# TEACHING & LEARNING OBJECTIVES FOR SDG 9
# JSS COLLEGE OF PHARMACY, OOTY

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| Subject/ topic/ course in regular curriculum relating to SDG 9 | • **Course : II M Pharmacy**<br>**Subject Dissertation**<br>**Sem:III**<br>**Cognitive Teaching & learning objectives**<br>• The learner understands the concepts of sustainable infrastructure and industrialization and society's needs for a systemic approach to their development.<br>• The learner understands the local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization.<br>• 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.<br>• The learner is aware of new opportunities and markets for sustainability innovation, resilient infrastructure and industrial development.<br>**Socio-emotional Teaching & learning objectives**<br>• The learner can encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms.<br>**Behavioural Teaching & learning objectives**<br>• The learner can evaluate various forms of industrialization and compare their resilience.<br>• The learner is able to access financial services such as loans or microfinance to support their own enterprises.<br>• The learner can work with decision-makers to improve the uptake of sustainable infrastructure (including internet access).<br>**I M.Pharm Pharmacognosy- Industrial Pharmacognostical Technology**<br>**Topic: Industrial infrastructure development and R&D**<br>• The learner understands the establishment principles of herbal drug industry<br>• The learners develop the knowledge in developing a industry which is useful for the society by developing good products<br>• The learners develop the concepts of industry and its maintenance with infrastructural ideas<br>• The learners develop a knowledge on stability of industrial knowledge and commercialization of products through industry R&D<br>• The learners understand the quality research in industry and develop society beneficial products which will be useful for the industry as well.<br>• The learners understand how to Development of local people by providing the knowledge and employment. |

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| | **II D Pharm**<br>**Subject:** Pharmacy Ethics & Law<br>**Topic :** Manufacture of Drugs<br>**Cognitive Teaching & learning objective:**<br>• The learner understands the concepts of sustainable infrastructure and industrialization and society's needs for a systemic approach to their development.<br>• The learner understands the local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization.<br>**Socio-emotional Teaching & learning objectives:**<br>• The learner can argue for sustainable, resilient and inclusive infrastructure in their local area.<br>• The learner can encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms.<br>• The learner can find collaborators to develop sustainable and contextual industries that respond to our shifting challenges and to reach new markets.<br>• 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.<br>**Behavioral Teaching & learning objectives:**<br>• The learner can evaluate various forms of industrialization and compare their resilience.<br><br>B.Pharm, Second Year, III Sem, Pharmaceutical Microbiology, Unit II - Equipments employed in large scale sterilization<br>Unit IV - Designing of aseptic area<br>Unit V - Application of cell cultures in pharmaceutical industry<br>M.Pharm, First year, I Sem, Advanced Pharmaceutical Biotechnology<br>Biodegradation of xenobiotics, chemical and industrial wastes, Production of single-cell protein, Applications of microbes in environmental monitoring |

# TEACHING & LEARNING OBJECTIVES FOR SDG 9
# FACULTY OF HEALTH SYSTEM MANAGEMENT STUDIES

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| Subject/ topic/ course in regular curriculum relating to SDG 9 | • Strategic management/MBA-HA/PA-Second Semester<br>• Principles and practices of Management/Organization skills /BBA and MBA HA/PA – I Semester<br>• Total Quality Management/MBA-HA/PA-Second Semester<br>• Financial Management/MBA-HA-Second Semester<br>• Drug sales and EXIM/Entrepreneurial opportunity – MBA PA -III Semester<br>• Business Environment/Entrepreneurial opportunity- BBA- I Semester<br>• Business Economics/Market structure- BBA – II Semester<br>• Management Information System-information system and networking- BBA-HHSM III semester<br>• Corporate social responsibility/ BBA HHSM- V Semester<br>• Entrepreneurship Development – IV semester BBA |
| Cognitive<br>Teaching & learning objectives | • The learner understands the importance of strategy in developing business and its role in economic development<br>• The learners understand the organizing skills to organizing human and material resources for industry<br>• The learner understands the concept of quality and quality management in health care industry this will help to have a better infrastructure and health care industry<br>• Learner learns about various financial management techniques to help to have strong and efficient financial system for the organization<br>• Learner finds out the entrepreneurial opportunity available in drugs industry at national and international level<br>• Learner at UG level understand the business environment and can evaluate the various opportunity to develop industry and infrastructure for the country<br>• At course, learner understand different type of market structure, features and role of them in economic development<br>• Learner understands the role and responsibilities as an organization to work for the betterment of society.<br><br>**Membership: DHSMS is member of Academy of Hospital Administration, New Delhi** |

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| Socio-emotional Teaching & learning objectives | • Leaner can use the knowledge gained in assisting top level management of Hospital to develop infrastructure and other facilities for the society<br>• Learner can use the knowledge of the same to start career or to become entrepreneur in the health care industry thereby contributes to the societal benefits<br>• Learner can help the management and society to understand the responsibility of a corporate in developing the society<br> <br> <br> |

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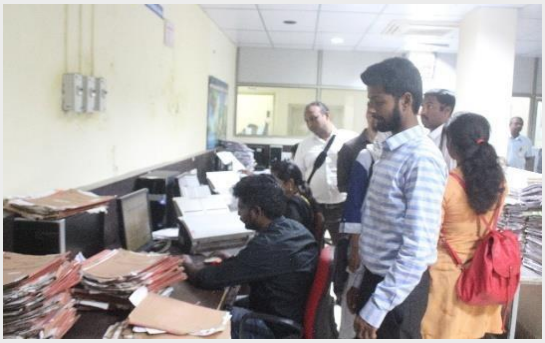
| Behavioural<br>Teaching & learning objectives | • Learner analyses the environment for opportunity available in health care industry<br>• Learners can start their own business after the course and it will help to create infrastructure and job in economy<br>• Learner can do EXIM business in pharma – it will contribute to the balance of payment<br>• Learner can use the knowledge to improve the standards of the industry<br>  |

# TEACHING & LEARNING OBJECTIVES FOR SDG 9
# JSS SCHOOL OF LIFE SCIENCES, OOTY

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| Cognitive<br>Teaching & learning objectives | • The learner understands the concepts of sustainable infrastructure and industrialization and society's needs for a systemic approach to their development.<br>• The learner understands the local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization.<br>• 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.<br>• The learner is aware of new opportunities and markets for sustainability innovation, resilient infrastructure and industrial development. |
| Socio-emotional<br>Teaching & learning objectives | • The learner can argue for sustainable, resilient and inclusive infrastructure in their local area.<br>• The learner can encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms.<br>• The learner can find collaborators to develop sustainable and contextual industries that respond to our shifting challenges and to reach new markets.<br>• 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.<br>• 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. |
| Behavioural<br>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 with regard to disaster risk reduction.<br>• The learner can evaluate various forms of industrialization and compare their resilience.<br>• The learner is able to access financial services such as loans or microfinance to support their own enterprises.<br>• 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, Innovationand 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?"

# DEPARTMENT OF YOGA

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| Subject/ topic/ course in regular curriculum relating to SDG 9 | • Biomechanics & Yoga, Lifestyle Disorder& Yoga Management , Workshop, Research proposal writing, Yoga postings, Dissertation / projects.<br>• The course content directly / indirectly helps in development of research and innovation skills in learners. |
| Cognitive Teaching & learning objectives | **At the end of 2nd year and course the learner should be able to,**<br>• Understands the concepts of Yoga science, need for systemic approach for innovation in treatment and management of health ailments.<br>• Understands the local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization. |
| Socio-emotional Teaching & learning objectives | **At the end of 2nd year and course the learner should be able to,**<br>• Utilize sustainable and reliable Information and communications technology processes and services for reaching the outreach, providing personalized/disease specific Yoga module.<br>• Find hospital collaborators to develop new yoga module which is affordable to all. |
| Behavioural Teaching & learning objectives | **At the end of 2nd year and course the learner should be able to,**<br>• Implement plans for affordable access to technologies and infrastructure essential for Yoga studio & Yoga institutes.<br>• Find opportunities for research & innovation in development of yoga module achieving sustainable, affordable health for all.<br>• Will be able to support entrepreneurship and collaborative work using technological innovation in health care sector providing personalized Yoga support, cloud couselling, using electronic databases for trend analysis. |

## Topics for SDG 9 "Industry, Innovation and Infrastructure"

- Develop and evaluate ideas for sustainability-driven innovation and entrepreneurship.
- Updates on recent advances in health care, innovations and policies for adapting new sustainable technologies at affordable prices
- Role of industry participation in developing Yoga & health for all.

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

- Conduction of workshop/conference to share innovative research ideas with industrial support.
- Role play on the effect of non availability of internet access and technology in learning
- Industry collaborative competitions for research & innovation in development of Yoga module and helping achieving sustainable, affordable health for all.
- Support entrepreneurship and collaborative work using technological innovation in health care sector using electronic databases for trend analysis.

# BSC Yoga

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| Subject/ topic/ course in regular curriculum relating to SDG 9 | • Application of Yoga for society, Yogic psychology, Yoga for mental health, Yoga for oncology, Introduction to Physiotherapy & Exercise Therapy , Hatha yoga, Rehabilitation psychology, Environmental psychology |
| Cognitive Teaching &learning objectives | **At the end of final Professional year, the learner should be able to,**<br>• Understands the local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization.<br>• Understands the concepts of Yoga, need for systemic approach for innovation in treatment and management of health ailments. |
| Socio-emotional Teaching &learning objectives | **At the end of final year the learner should be able to**<br>• Find hospital collaborators to develop new yoga module which is affordable to all.<br>• Utilize sustainable and reliable Information and communications technology processes and services for reaching the outreach, providing personalized Yoga module.<br>• |
| Behavioural Teaching &learning objectives | **At the end of final year the learner should be able to**<br>• Find opportunities for research & innovation in development of yoga module achieving sustainable, affordable health for all. |

**Learning approaches and methods for SDG9 "Industry, Innovation and Infrastructure"**

- Role-play to encourage the students to get involve in new innovative idea development
- Develop a business continuity plan for a local enterprise after the impact of a natural
- Conduction of research fair to share innovative research idea
- Poster competition and essay writing .

**Topics for SDG9"Industry, Innovation and Infrastructure"**

- Impact of new technologies and quality infrastructure on economic growth and social development
- Industry collaborative competitions for research & innovation in development of Yoga module and helping achieving sustainable, affordable health for all.

# DEPARTMENT OF MICROBIOLOGY

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| **Subject/ topic/ course in regular curriculum relating to SDG 9** | • Industrial Microbiology (BSc VI Sem); Microbial Biotechnology (BSc VI Sem); Industrial Training And Entrepreneurship (BSc VIII Sem); Food And Dairy Technology (MSc II Sem); Pharmaceutical Microbiology (MSc II Sem); Industrial Microbiology and Fermentation Technology (MSc III Sem) |
| **Cognitive Teaching & learning objectives** | • Emphasizes on principles and concepts of entrepreneurship, its historical development, and the importance of entrepreneurship in economic development; Enables to effectively apply the theories and various approaches of entrepreneurship; Provides the knowledge of applications of microorganisms in biotransformation processes; Understand the potential of microbes to manufacture genetically engineered therapeutics. |
| **Socio-emotional Teaching & learning objectives** | • Appreciate the importance of entrepreneurship and value the characteristics of successful entrepreneur; Identify business opportunities in chosen sector / sub-sector; Develop a small business enterprise byliaising with different stake holders; Implement business ethics and operate small scale enterprises; |
| **Behaviorial Teaching & Learning objectives** | • Visiting food, dairy, pharmaceutical and beverage industries and learn the techniques; Know about the patent filing, product discovery and also start up the company in regarding to the nutritional and therapeutic values of microorganisms. |

**Learning approaches and methods for SDG 9**

- Developing information and communication technology (ICT) based sustainable infrastructure
- Role of microbiologists in Industries
- Explain the importance of microbes in biotechnological applications; Demonstrate the application ofmicroorganisms in the production of vaccines, antibioticsand biofertilizers; Demonstrate the role of microorganisms in biotransformation industries;

**Suggested topics for students workshop**

- Develop microbe based products for industrial infrastructure
- Train students in Innovation for sustainable development
- Develop pilot scale microbial fuel cell based transport systems
- Appraise the role of microorganisms in industrial productions and also an understanding of advance technologies in microbial biotechnology.

# DEPARTMENT OF ENVIRONMENTAL SCIENCES

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| Course Name in curriculum relating to SDG 9 | • Environmental Earth Science (DSC 08)<br>• Environmental Disaster Management (DSC 12)<br>• Evolutionary Biology (DSC 15)<br>• Environmental Chemistry (DSC 17)<br>• Catalysis for Environmental Applications (DSE 2a) |
| Cognitive<br>Teaching & learning objectives | • The learner understands the concepts of sustainable infrastructure and industrialization and society's needs for a systemic approach to their development.<br>• The learner understands the local, national, and global challenges and conflicts in achieving sustainability in infrastructure and industrialization.<br>• 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.<br>• The learner is aware of new opportunities and markets for sustainability innovation, resilient infrastructure, and industrial development. |
| Socio-emotional<br>Teaching & learning objectives | • The learner can argue for sustainable, resilient, and inclusive infrastructure in their local area.<br>• The learner can encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms.<br>• The learner can find collaborators to develop sustainable and contextual industries that respond to our shifting challenges and to reach new markets.<br>• 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.<br>• 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<br>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.<br>• The learner can evaluate various forms of industrialization and compare their resilience.<br>• The learner can access financial services such as loans |

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| | or microfinance to support their own enterprises.<br>• 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?"

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

- Develop and evaluate ideas for sustainability-driven innovation and entrepreneurship.
- Increasing nutrition security, good health practices and sustainable agriculture systems.
- Updates on recent advances in health care, innovations and policies for adapting new sustainable technologies at affordable prices
- Role of industry participation in developing nutrition & health security for all.

# DEPARTMENT OF NUTRITION & DIETETICS

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| Subject/ topic/ course in regular curriculum relating to SDG 9 | • Topics – Personalized Nutrition, Nutraceuticals & Functional foods, Molecular Nutrition, Hospital Internship, Dissertation / Summer projects.<br>• The course content directly / indirectly helps in development of research and innovation skills in learners. |
| Cognitive<br>Teaching & learning objectives | **At the end of 2nd year and course the learner should be able to,**<br>• Understands the concepts of nutrition sciences, need for systemic approach for innovation in treatment and development of health products.<br>• Understands the local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization. |
| Socio-emotional<br>Teaching & learning objectives | **At the end of 2nd year and course the learner should be able to,**<br>• Recognize and reflect on their own personal demands on the local infrastructure such as their carbon and water footprints and food miles.<br>• Utilize sustainable and reliable Information and communications technology processes and services for reaching the outreach, providing personalized/disease specific nutrition education.<br>• Find industrial collaborators to develop new therapeutic food system affordable to all. |
| Behavioural<br>Teaching & learning objectives | **At the end of 2nd year and course the learner should be able to,**<br>• Implement plans for affordable access to technologies and infrastructure essential for agriculture development and food security.<br>• The learner can find opportunities for research & innovation in development of therapeutic foods, neutraceticals/functional foods helping achieving sustainable, affordable health for all.<br>• Will be able to support entrepreneurship and collaborative work using technological innovation in health care sector providing personalized nutrition support, cloud couselling, using electronic databases for trend analysis. |

**and methods for SDG 9 "Industry, Innovation and Infrastructure"**

- Conduction of expos & fairs to share innovative research ideas with industrial support.
- Role play on the effect of non availability of internet access and technology in learning
- Industry collaborative competitions for research & innovation in development of therapeutic foods, neutraceticals/functional foods helping achieving sustainable, affordable health for all.
- Support entrepreneurship and collaborative work using technological innovation in health care sector using electronic databases for trend analysis.

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

- Develop and evaluate ideas for sustainability-driven innovation and entrepreneurship.
- Increasing nutrition security, good health practices and sustainable agriculture systems.
- Updates on recent advances in health care, innovations and policies for adapting new sustainable technologies at affordable prices
- Role of industry participation in developing nutrition & health security for all.

# MSc Sports Nutrition & Management

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| Subject/ topic/ course in regular curriculum relating to SDG 9 | • All practical components/finance management/ Basics of management/ Principles of marketing/Entrepreneurship development |
| Cognitive Teaching & learning objectives | At the end of 1st professional year, the student should be able to<br>• understand the concepts of sustainable laboratory, infrastructure and industrialization and need for a systemic approach to their development.<br>• The learner understands the local, national, and global challenges and conflicts in achieving sustainability in infrastructure and industrialization. |
| Socio-emotional Teaching & learning objectives | At the end of the program, the student should be able to<br>• argue for sustainable, resilient, and inclusive infrastructure in their laboratories and entrepreneurial ventures.<br>• encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms.<br>• find collaborators to develop sustainable and contextual industries that respond to our shifting challenges and to reach new markets.<br>• recognize and reflect on their own personal demands on the local infrastructure such as their carbon and water footprints and food miles. |
| Behavioural Teaching & learning objectives | At the end of the program, the student should be able to<br>• identify opportunities in their own culture and nation for greener and more resilient approaches for sustainable laboratory infrastructure, understanding their overall benefits for the institution, societies, especially with regard to disaster risk reduction.<br>• access financial services such as loans or microfinance to support their own enterprises.<br>• work with decision-makers to improve the uptake of sustainable infrastructure (including internet access). |

**Examples of learning approaches and methods for SDG 9 "Industry, Innovationand**

Role-play a day without access to electricity

Develop a business continuity plan for a local enterprise after the impact of a natural hazard

Engage students and young people in developing spaces for community get-togethers Develop an enquiry-based project: "Is all innovation good?"

**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

## BSc Food, Nutrition & Dietetics

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| Subject/ topic/ course in regular curriculum relating to SDG 9 | • Food processing, Food chemistry, Dairy technology, Community nutrition, Development of value enhanced products, Food preservation and adulteration, Food and Nutrition security, food nanotechnology, Food biotechnology, Food processing and technology industrial /Hospital internship, Food service management. |
| Cognitive<br>Teaching &learning objectives | **At the end of 1 & 2nd Professional year, the learner should be able to,**<br>The learner understands the concepts of societal needs, nutritional importance in new food product development at industrial level, sustainable goals for innovation in the field of food industry.<br>• Processing effect on nutritional composition of different foods.<br>• Food preservation techniques<br>• Food packaging<br>• To understand the concept of food forensics and toxicology<br>• Learners understand and learn about different food packaging materials and methods and ecofriendly packaging importance.<br>• Learn the concept of food forensics and toxicology to minimize the health problems. Learn about the natural toxins present in food and their health hazards along with analytical techniques.<br>• Understands the local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization.<br>• Pitfalls of unsustainable industrialization and in contrast knows examples of resilient, inclusive, sustainable industrial development and the need for contingency planning.<br>• Aware of new opportunities and markets for sustainability innovation, resilient infrastructure and industrial development. |
| Socio-emotional<br>Teaching &learning objectives | **At the end of final year the learner should be able to**<br>• Find collaborators to develop sustainable and contextual food industrial innovation that respond to our shifting challenges and to reach consumers.<br>• Recognize and reflect on their own personal demands on the local infrastructure to fulfill the consumer needs.<br>• Encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms.<br>• Understand about changing resource availability for production of new product and other external resources availability. Impact of new innovative ideas in the field of food industry. Societal benefits, awareness on |
| Behavioural<br>Teaching &learning objectives | **At the end of final year the learner should be able to**<br>• The learner can evaluate various forms of food industries and compare their resilience.<br>• The learner can work with different food industry personnel to improve the knowledge of present requirement. |

## Learning approaches and methods for SDG9 “Industry, Innovation and Infrastructure”

1. Role-play to encourage the students to get involve in new innovative idea development
2. Develop a business continuity plan for a local enterprise after the impact of a natural
3. Conduction of research fair to share innovative research idea
4. Poster competition and essay writing on the methods of enhancing industrial innovation

## Topics for SDG9“Industry, Innovation and Infrastructure”

1. Impact of new technologies and quality infrastructure on economic growth and social development
2. Local, national and global challenges and conflicts in achieving sustainability in food processing and new product development
3. Basic support in center of excellence for new innovative product development.
4. Inclusive and sustainable innovation in the new product development as sustainable approach.

# DIVISION OF BIOCHEMISTRY

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| Subject/ topic/ course in regular curriculum relating to SDG 9 | • Biochemical techniques<br>• Analytical Biochemistry |
| Cognitive<br>Teaching & learning objectives | In this course, learners will be able to demonstrate methods for purifying proteins, and<br>analyzing biological molecules by electrophoresis, Western blotting, and enzyme activity assays.<br>**At the end of the first and second units, the learners will be able to**<br>• Understand the crucial separation techniques for implementation of research ideas at molecular level.<br>• adopt various techniques in biological research.<br>**By the end of the third unit, the learner will be able to**<br>• understand the use of radioactivity in biological research<br>• get acquainted with staining techniques used in biochemical research.<br>**In general, by the end of the course, the learners would be able to**<br>• understand the basic principles of various biochemical techniques.<br>• understand separation and characterization of biomolecules using different chromatographic methods, electrophoretic methods and blotting techniques.<br>• understand the optimization of various techniques.<br>• use these techniques for the development of industrial infrastructure.<br>• significantly enhances their employability in Biotechnological, Pharmaceutical Industries and Analytical Laboratories and research institutes. |
| Socio-emotional<br>Teaching & learning objectives | • The learner can adopt these techniques to build small diagnostic laboratories. This results in making individual self-sustainable and serving for the benefit of people.<br>• The learner can find collaborators to develop most advanced (innovative) analytical techniques that further boost up the development of industries.<br>• This creates sustainable job market, opportunities to young people and open the door for investments. |
| Behavioural<br>Teaching & learning objectives | • The learner can connect with other industrial partner to develop innovative technologies that can adopt to develop pharmaceuticals/drugs that can be used for the benefit of people/society.<br>• The learner is able to start their own startups (small-scale industries) and they can access financial services such as loans or microfinance to support their own enterprises.<br>• The learner can evaluate various forms of industrialization and compare their resilience. Further, they can think towards the development of sustainable infrastructure. |

## 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, Innovationand 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?"

# DIVISION OF COGNITIVE NEUROSCIENCE AND PSYCHOLOGY

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| Subject/ topic/ course in regular curriculum relating to SDG 9 | • Industrial Psychology<br>  • Motivation and job satisfaction<br>  • Performance management<br>• Fundamentals of Marketing and Consumer Behaviour<br>  • Promotion and advertising<br>  • Effective marketing segmentation |
| 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.<br>• The learner understands the local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization.<br>• 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.<br>• 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.<br>• The learner can encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms.<br>• The learner can find collaborators to develop sustainable and contextual industries that respond to our shifting challenges and to reach new markets.<br>• 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.<br>• 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. |
| Behavioural 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 with regard to disaster risk reduction.<br>• The learner can evaluate various forms of industrialization and compare their resilience.<br>• The learner is able to access financial services such as loans or microfinance to support their own enterprises.<br>• 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"

Relevance of an intimate consideration of positive, productive, and healthy working arrangements and conditions.

The need for promoting freedom, equity, security, and human dignity by promoting positive working arrangements (e.g., voluntary versus forced labor) and working conditions (e.g., safe working conditions).

The relation of promotion of worker wellbeing and effectiveness in the private sector to productivity and working conditions.

Range of issues that are of particularly great importance to private-sector workers and organizations involved in international development.

The sustainability of the internet – from green chat groups to the ecological footprint of search-engine servers

Alternative currencies as investment in local infrastructure

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

Research into the connections between worker motivation and aspects of psychological well-being at work including job satisfaction and satisfaction with life.

The integration of tools, theories, and perspectives from I-O psychology into international development work.

Engage students and young people in developing spaces for community get-togethers

Develop an enquiry-based project: "Is all innovation good?"

# DIVISION OF LANGUAGES

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| Cognitive Teaching & learning objectives | • The learner understands the importance of vocabulary building in enhancing communication and soft skills.<br>• The learner understands that importance of completing tests in the Language Lab based on IELTS which will help them get admitted to renowned higher educational institutions in Europe and North America. |
| Socio-emotional Teaching & learning objectives | • An ability to understand how words are pronounced differently in different countries provides access to understand their native language better.<br>• Learners can build confidence in themselves and learn other foreign languages.<br>• The learners can develop their personality and gain confidence and face the challenges in the corporate world. |
| Behavioral Teaching & learning objectives | • The learner will have less fear and hesitation while communicating with others and while visiting a foreign country in Europe or North America.<br>• Language Lab facilitates global business communication between executives. |

Suggested topics for student workshops/training

- ✓ Conducting workshops by calling international speakers on developing of soft skills, critical thinking skills and how to communicate in the corporate world.
- ✓ Conduct special lectures on stress management, facing interviews and personality development.

# DIVISION OF MEDICAL STATISTICS

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| Subject/ topic/ course in regular curriculum relating to SDG 9 | • Documentation & Research Methodology<br>• Data Modelling tools and techniques |
| 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.<br>• The learner understands the local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization.<br>• 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.<br>• 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.<br>• The learner can encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms.<br>• The learner can find collaborators to develop sustainable and contextual industries that respond to our shifting challenges and to reach new markets.<br>• 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.<br>• 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. |
| Behavioural 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 with regard to disaster risk reduction.<br>• The learner can evaluate various forms of industrialization and compare their resilience.<br>• The learner is able to access financial services such as loans or microfinance to support their own enterprises.<br>• 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"

- Data mining, statistical machine leaning and Artificial intelligence algorithms
- Data Modeling using R
- Python Programming using AI
- Data Analysis Using machine leaning tools

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

- to analyse the facts and figures gotten through secondary information's to determine the resultant effect of research in the pursuance of the SDGs
- to establish a reliable research methodology for assessing goals
- classification and detection system in critical industrial internet of things infrastructure using machine learning algorithms
- Enhancing Cyber Infrastructure: A Multiple Regression Analysis Approach
- Industrial Infrastructure Downtime Pre-emption using Hybrid Machine Learning and NLP

# DIVISION OF GEOINFORMATICS

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| Subject/ topic/ course in regular curriculum relating to SDG 1 | • Site suitability analysis for establishing industries.<br>• Network analysis for urban planning<br>• GIS for Transportation InfrastructureManagement<br>• GIS For Infrastructure Planning And Development<br>• GIS and BIM Integration in Infrastructure Design and |
| Cognitive<br>Teaching & learning objectives | At the end of 2nd year the learner should be able to<br>• understands the concepts of sustainable infrastructure and industrialization and society's needs for a systemic approach to their development.<br>• Apply geospatial technology to achieve sustainability in infrastructure and industrialization.<br>• Analysis of site suitability for industrial establishments, urban planning and transportation system. |
| Socio-emotional<br>Teaching & learning objectives | At the end of final year the student should be able to<br>• The learner can propose a plan for sustainable, resilient and inclusive infrastructure in their local area using GIS.<br>• The learner can encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms.<br>• The learner can find collaborators to develop sustainable and contextual industries that respond to our shifting challenges and reach new markets.<br>• The learner can recognize and reflect on the use of geospatial technology to Build infrastructure, promote inclusive and sustainable industrialization and foster innovation. |
| Behavioural<br>Teaching & learning objectives | At the end of the program the learner should be able to<br>• 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 with regard to disaster risk reduction.<br>• The learner can evaluate various forms of industrialization and compare their resilience using GIS.<br>• The learner can work with decision-makers to improve the uptake of sustainable infrastructure by offering a spatial decision support system. |

| Suggested topics for SDG 9 "Industry, Innovation and Infrastructure." |
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| • GIS and BIM Integration in Infrastructure Design and Construction<br>• Building Information Modeling in Construction and Design<br>• The relation between quality infrastructure and the achievement of social, economic, and political goals<br>• Utility GIS for basic infrastructures like roads, information and communication technologies, sanitation, electrical power, and water<br>• The sustainability of transport infrastructure using GIS<br>• Support and promote projects that create quality, reliable, sustainable, and resilientinfrastructure. |

| Examples of learning approaches and methods for SDG 9 "Industry, Innovation and Infrastructure." |
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| • Engage students in developing GIS methodology for selection of location for the industry setup<br>• Develop an inquiry-based project by integrating GIS and BIM.<br>• ESRI GIS MOOC courses from the online portals<br>• IIRS-EDUSAT programs for skill development |

Sustainable Development Goals

***'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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