



ગુજરાત કેન્દ્રીય વિશ્વવિદ્યાલય
CENTRAL UNIVERSITY OF GUJARAT
(Established by an Act of Parliament, 2009)



Ministry of Human Resource Development
Government of India



GLOBAL INITIATIVE OF ACADEMIC NETWORKS

Bioremediation Technology:

Hazardous Waste Management

MHRD Scheme on Global Initiative on Academic Network (GIAN)

15th to 25th February, 2016

School of Environment and Sustainable Development

CENTRAL UNIVERSITY OF GUJARAT

Sector 29, Gandhinagar, Gujarat, INDIA

www.cug.ac.in

Prof. S.A. Bari

Hon. Vice-Chancellor,
Central University of Gujarat



About CUG

The Central University of Gujarat (CUG) was established by the Parliament of India in 2009 and is funded through the University Grants Commission (UGC) of the Ministry of Human Resource Development, Government of India. Its core objectives are dissemination and advancement of knowledge. CUG is committed to making special provisions for integrated courses, to educating and training human resource for the country's development, to initiating appropriate measures for promoting innovation in teaching and learning, and to paying special attention to the improvement of the social and economic conditions and welfare of the people, especially their intellectual, academic and cultural development.

Vision

The vision of CUG is to establish itself as a centre of excellence with social commitment by integrating modern, scientific and technological knowledge and skills with the basic human ethos and values. The University shall set forth a model in teaching, research and personality development and create skilled human resource with a sense of responsiveness towards society, the country and the world at large.

Mission

The mission of CUG is to provide access to quality education and create opportunities for encouraging students to effectively engage with emerging innovations and technological challenges, international competitiveness and leadership in thought as well as in action. CUG is also conscious of the importance of developing entrepreneurial and scholastic abilities for creation of knowledge, wealth and prosperity for the country as well as peace and happiness for human beings.

Motto

Providing a global platform for knowledge and employability to our students along with society and industry interface.

Global initiative of Academic Network

Global Initiative for Academic Networks (GIAN) in Higher Education aimed at tapping the talent pool of scientists and entrepreneurs internationally to encourage their engagement with the institutes of Higher Education in India so as to augment the country's existing academic resources, accelerate the pace of quality reform, and elevate India's scientific and technological capacity to global excellence. GIAN is envisaged to catalyse higher education institutions in the country, and that it will initially include all IITs, IIMs, Central Universities, IISc Bangalore, IISERs, NITs and IIITs subsequently cover good State Universities where the spinoff is vast. GIAN is an evolving scheme which will initially include participation of foreign faculty in Institutes as Distinguished / Adjunct / Visiting faculty / Professors of Practice, etc., to participate in delivering Short or Semester-long Courses. Other activities will be included in due course.

In order to garner the best international experience into our systems of education, enable interaction of students and faculty with the best academic and industry experts from all over the world and also share their experiences and expertise to motivate people to work.

GIAN is envisaged to achieve the following objectives

1. To increase the footfalls of reputed international faculty in the Indian academic institutes.
2. Provide opportunity to our faculty to learn and share knowledge and teaching skills in cutting edge areas.
3. To provide opportunity to our students to seek knowledge and experience from reputed International faculty.
4. To create avenue for possible collaborative research with the international faculty
5. To increase participation and presence of international students in the academic Institutes.
6. Opportunity for the students of different Institutes/Universities to interact and learn subjects in niche areas through collaborative learning process.
7. Provide opportunity for the technical persons from Indian Industry to improve understandings and update their knowledge in relevant areas.
8. Motivate the best international experts in the world to work on problems related to India.
9. Develop high quality course material in niche areas, both through video and print that can be used by a larger body of students and teachers.
10. To document and develop new pedagogic methods in emerging topics of national and international interest

GIAN@ Central University of Gujarat

Bioremediation Technology for Hazardous Waste Management

Course Coordinator

Prof. M H Fulekar

Dean,
School of Environment and Sustainable Development
CENTRAL UNIVERSITY OF GUJARAT



Overview:

Environmental pollution has become a global concern due to rapid growth of industrialization, urbanization and modern development in chemical processes, operation and production. Technological innovations in industries have given rise to new products and new pollutants in abundant level which are above the self-cleaning capacity in environment. The present treatment technology involving phyco-chemical and biological methods are not efficient / effective to treat the contaminant to acceptable level. Today Environmental biotechnology has been considered as emerging science for environmental protection. The technology involves the use of microorganisms for biological treatment of pollutants. Biotechnological treatment is carried out at lower temperature and pressure which requires less energy than the conventional physico-chemical treatment technology. The industry generating hazardous waste has been found beneficial from the emerging trend of biotechnological treatment. Biotechnological innovation for treatment of hazardous waste under controlled environmental condition have been found cost-effective in reducing pollution potential of toxic contaminants to enhance public acceptance and compliance with the environmental legislation. Environmental pollution such as contaminated soil or surface / ground water can be solved by bioremediation or phytoremediation by use of biological living organisms and green technology.

The internationally renowned experts working in the field of environment biotechnology - bioremediation, and phytoremediation technology will deliver lectures and discuss case studies pertaining to detoxification and decontamination of hazardous waste to clean-up the environment.

Objectives

- Participant's exposure to the industrial waste disposal site to understand the hazardous waste – treatment technology.
- Development of bioremediation/ phytoremediation technology in laboratory
- Rhizosphere bioremediation for hazardous waste – heavy metals and organics
- Demonstration of developed bioremediation / phytoremediation technology to the participants.
- Transfer of technology from lab to land.

Course module

- Introduction: Hazardous waste and toxic waste.
- Characterization of waste based on: Toxicity, reactivity, ignition.
- Present Treatment Technology of Hazardous Waste
- Concept and fundamentals of Bioremediation
- Phytoremediation technology for Sustainable Development.
- Microbial Ecology: Fundamentals of Physiology and diversity
- Ecology of Bioremediation in soil
- Biochemistry and Genetics in Bioremediation
- Bioremediation: Metabolism, Co- Metabolism, Energetic of transformation
- Monitoring of Bioremediation: Kinetics and Genetics
- Bioremediation: Pesticides, Petrochemicals waste, Dye stuff-Case studies
- Bioremediation of Organics and heavy metals.
- Molecular based approaches for Bioremediation
- Bioinformatics in Bioremediation
- Metagenomics approaches in Bioremediation
- Environmental Nano- technological approaches for Bioremediation
- Nano based membrane filtration technology
- Nano based Waste Water treatment technology
- Act Rules and Regulation for Management Hazardous waste.
- IPR: transfer of technology-Lab to Land
- Bioremediation technology / Phytoremediation technology and its application in field

Teaching Faculty



Prof. Andy V. Ogram

Soil and Water Science Department,
University of Florida

Prof Andrew Ogram is a microbial ecologist with interests in linking human activities to shifts in the structures and functions of microbial communities in soils and sediments. He is particularly interested in the microbial ecology of coupled biogeochemical cycles in anoxic zones. He is a professor in the Soil and Water Science

Department and teaches undergraduate and graduate level courses in microbial ecology and environmental science.

Other Expert Teaching Faculty

Prof Anil Kumar Dikshit (Waste Water Treatment, Industrial Solid Waste Management)
Centre for Environmental Science and Engineering, IIT-Bombay

Prof. Indu Shekhar Thakur (Environmental Microbiology and Biotechnology)
School of Environmental Sciences, Jawaharlal Nehru University-New Delhi

Prof. M.N.V. Prasad (Environmental Biotechnology)
Department of Plant Sciences, University of Hyderabad

Prof Rana Pratap Singh (Specialization: Environmental Biotechnology/Stress Biology)
Dean, School for Environmental Sciences
Babasaheb Bhimrao Ambedkar University-Lucknow

Prof Nisha Shah (Environmental Nanotechnology)
Department of Chemistry, Uni. School of Sciences, Gujarat University

Dr Dimple Dutta (Environmental Nanotechnology)
Chemistry Department, Bhabha Atomic Research Centre - Trombay

Dr C R Chavan (IT and System Management)
Jamnalal Bajaj Institute of Management Studies - Mumbai

Dr Janmejay Pandey
(Microbial Physiology, Microbial genetics, Molecular microbial Ecology)
Department of Biotechnology, Central University of Rajasthan

Target Group

The Environmentalist, Environmental consultant, Environmental engineers, Environmental managers, teachers, researchers working in environmental problems, faculty from reputed institutions

You Should Attend If...

- You are an Environmentalist or industrial personal, working in the area of Bioremediation / Phytoremediation technology
- You are Environmental Engineer, interested to learn advance treatment technology for decontamination of toxic waste
- You are a student, research scholar or faculty from academic institution, interested in learning how to do research in the area of Bioremediation / Phytoremediation or to develop technologies for decontamination in water-soil environment

Fee Structure

Research scholar / Students	₹	5,000.00
Faculty / Staffs of Academic Institutions	₹	10,000.00
Industry / Research Organizations Persons	₹	25,000.00
Participants from abroad	US \$	500.00

The fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.

Contact Us

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SCHOOL OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT (SESD)

Environmental and sustainable development aims to use natural resources and eco-friendly technology to meet human needs while preserving and conserving the air, water and soil environment and maintaining the ecological balance. Sustainable development is a learning process about making decisions that consider long term future of the natural resources. Life on earth is essential for long term sustainability of environment, continuity of life on earth and maintenance of integrity. The man-environment relationship indicates that pollution and deterioration of the environment have a social origin. Environment pollution has become a major global concern.

Global society is facing challenge of improving the quality of air, water, soil and monitoring environment - ecological balance. The growth of industrialization, urbanization, modern agricultural development and energy generation has resulted in the indiscriminate exploitation of natural resources for fulfilling human desires and needs on which the quality of our environment depends. In recent time, one of the major issues is the threat to human life from the progressive deterioration of the environment.

Sustainable development emphasizes the use of natural resources and employing eco-friendly technology for production, processing and operation in industries and making societies ready for environmental development and management. Therefore, understanding and development of knowledge for environmental awareness, Environment problems and mitigation of adverse impact are essential through Environmental Education. The School of Environment and Sustainable development is offering M.Phil. / Ph.D. programme since its inception-201. M.Sc. in Environmental Sciences has also been started from 2015-2016 to support the basic research understanding in the field. Centre for Climate change will also be started from the next academic year. Environment science research and studies focus on dynamic relationship of natural processes and their impact on environment, economic and social system.

School of Environment and Sustainable Development (SESD) Research focusing on Thrust Areas :

1. Environmental Ecology
2. Biodiversity conservation
3. Environmental Pollution (Air/ water/ soil)
4. Hazardous/solid waste treatment technologies
5. Green energy generation
6. Climate Changer
7. Green technology
8. Environment Biotechnology
9. Environmental Nanotechnology