

Global Initiative of Academic Network

Name of Faculty: Dr. Subhas K. Sikdar

Affiliation:

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Course Title: **Sustainability and Engineering**

Broad Area: Earth & Environment Sciences

Scope of the course: The course is tailored-made for students, teachers, and industrial practitioners in science and engineering fields. The overall purpose is to provide a solid scientific understanding of sustainability, and how to make decisions about sustainability of products, processes, and other human enterprises.

Course details:

Sustainability and Engineering

13/12/2016 Tuesday

Lecture 1: 9.30 AM to 11.00AM

Generally understood concept of sustainability will be highlighted by examples from the realms of household and national finance (economic), poverty in societies (societal), and pollution (environmental). Societal contribution to un-sustainability will be highlighted.

What is the problem and how to rationally think about it.

Lecture 2: 11.45 AM to 1.15AN

The genesis of the term “sustainability” in recent times. Brundtland Commission or WCED. The various global summits to heighten the issues behind sustainability. History of research on sustainability and its ramifications. The role of science in understanding it and that of engineering in doing something about it.

Tutorial 1: 2.00PM to 4.00PM

The earlier concepts of waste minimization, pollution prevention, design for environment and their evolution to sustainability. The role of environmental regulation.

Business involvement: various international agreements and reporting requirements starting

with environmental compliance.

14/12/2016 Wednesday

Lecture 1: 9.30 AM to 11.00AM

Sustainability and Standards, Why are standards crucial to supporting sustainability. Various international and national standards organizations and Work on standards development

Lecture 2: 11.45 AM to 1.15AN

How sustainability can be an inspiration for innovations in technologies. Why innovations have always been the main engine for prosperity.

Tutorial 1: 2.00PM to 4.00PM

Compatibility of scientific and engineering disciplines with the concept of sustainability.

15/12/2016 Thursday

Lecture 1: 9.30 AM to 11.00AM

Progress of engineering analysis of sustainability from industry and academia, Sustainability as a systems approach involving interdisciplinary themes

Lecture 2: 11.45 AM to 1.15AN

Sustainability as a multivariate complex system, Industrial, community, ecological, agricultural, and technology systems, Special topics: Energy, water, food, agricultural, climate change

Tutorial 1: 2.00PM to 4.00PM

International issues helping or hurting sustainability: political issues
Geographical and virtual systems.

16/12/2016 Friday

Lecture 1: 9.30 AM to 11.00AM

Systems Classification, Sustainability metrics and their classification

Lecture 2: 11.45 AM to 1.15AN

Tools for sustainability: technology tools, analytical (mathematical) tools, cleaner chemistry etc., Data Issues (especially LCA-based)

Tutorial 1: 2.00PM to 4.00PM

Methods of sustainability analyses for various types of systems, Decision Making

17/12/2016 Saturday

Lecture 1: 9.30 AM to 11.00AM

Some examples will be provided that illustrate classifying in systems, choosing metrics, metrics classification and sorting, and doing exercises leading to decision making.

Lecture 2: 11.45 AM to 1.15AN

Energy by itself and water-energy nexus have become important topics of discussions these

days.

Tutorial 1: 2.00PM to 4.00PM

On top of that there are other binary and ternary nexuses, such water-energy-food nexus also needs to be considered. How do we analyze these systems is the core of this section.

Teaching Faculty

Dr. Subhas K Sikdar: Subhas Sikdar is Associate Director for Science at EPA's National Risk Management Research Laboratory. He received his PhD in chemical engineering from the Univ. of Arizona (1975) and has worked for Occidental Petroleum, General Electric, NIST, and EPA, mostly in R&D management. During his technical career he has authored or coauthored more than 80 journal papers, edited 13 books, and has been awarded 26 U.S. patents. He is a Fellow of AIChE, the American Association for the Advancement of Science, and the Indian Institute of Chemical Engineers, and has received AIChE's Research Excellence in Sustainability Award and the Lawrence K. Cecil Award in Environmental Chemical Engineering.

He recently served on the Board of Directors of the Green Chemistry Institute and the Council for Chemical Research. He has also served numerous chemical engineering departments as a member of external advisory boards. In AIChE, he founded and chaired the Sustainable Engineering Forum (SEF). He also served as the Chair of the Institute for Sustainability (IFS), and now chairs the Engineers Forum on Sustainability. Recently, his technical interest has been mostly focused on engineering sustainability, for which he has been a leader in EPA as well as in AIChE. Having directed 14 NATO workshops on sustainability issues in Europe for over 15 years, he has developed an international collaborative network on sustainability research. He is the founder/editor of Clean Technologies and Environmental Policy and a section editor of Current Opinions in Chemical Engineering.

Active Memberships:

AIChE Fellow Separations Division

Institute for Sustainability

Sustainability Engineering Forum -

Component to IFS

Ohio Valley Local Section

Roles:

Center for Energy Initiatives Board (Representative) (Institute for Sustainability)

AIChE Sustainable Engineering Forum (Immediate Past Chair) ((2003-05))

Institute of Sustainability Board (Member) (AIChE Sustainability Index Advisory Board Chair, US EPA)

Online contributions:

Webinar September, 2014, Assessing Sustainability with Metrics and Methods

Webinar September, 2012 The AIChE Sustainable Engineering Forum (SEF) and the Engineers Forum on Sustainability (EFS)

Who can attend:

- Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories.
- Student students at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions.

Registration Fees

Participants from abroad	: US \$500
Industry/ Research Organizations	: Rs. 10000/-
Academic Institutions	:Rs. 5000/-
Students	:Rs. 1000/-
SC/ST Students	:Rs. 500/-

The above fee includes all instructional materials, computer use for tutorials, 24 hr free internet facility and lunch. The participants will be provided with shared accommodation on payment basis.

There will be a concession of 50% of the fee for the faculty working in the constituent and affiliated colleges of JNTUH.

Limited accommodation is available in the University guest house and nearby student hostels run by private parties outside the University campus.

Host Faculty

Dr. VURIMINDI. HIMABINDU

Associate Professor in Environment
Institute of Science and Technology
JNT University Hyderabad
Kukatpally, Hyderabad-500085
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Dr. V. Himabindu: working as Associate Professor, Centre for Environment, and Co-ordinator, Centre for Alternative Energy Options, CEN, IST, JNTU Hyderabad, India. She earned PhD in Chemistry from JNTU Hyderabad. Dr. V. Himabindu research focuses on monitoring of Air, Water and Soil pollutants and their control technologies, Bio fuels production, Energy materials,

Sequestration of CO₂ gases from industrial air emissions and Hydrogen energy. She was as Co-coordinator for pollution control board sponsored project titled “Online air quality measurement in Hyderabad city”, and principle investigator for Baba Atomic Research Centre sponsored project titled “Base line air quality measurement at proposed mining area”.

Number of Publications:

S. No	Status of Journal	No. of papers
1	International Journals	50
2	National Journals	9
3	International Conferences	65
4	National Conferences	13

Teaching experience : **17 years**

No of R & D projects received from state and central Govt. Organizations: **12**

(BARC, APPCB, CPCB, DRDO, DST, UGC, SEDA- Sweden, MNRE, DBT)

Membership in professional:

1	Life member of The Indian Society for Technical Education.
2	Member of American Society of Civil engineers.
3	Central Pollution Control Board Approved Government analyst from Jan 2002.

Areas of Interest:

Pollution monitoring and control technologies

Air quality measurement and Air quality baseline data generation

Waste material recovery and reuse

Remediation of contaminated lakes

Biofuels

Carbon nano materials

Energy materials

Hydrogen production and storage