AIR POLLUTION AND CONTROL

PROF. BHOLA RAM GURJAR

Department of Civil

IIT Roorkee

INTENDED AUDIENCE : UG and PG (including Pre-PhD)
INDUSTRIES APPLICABLE TO : Industries dealing with emissions and air pollution control may value this course.

COURSE OUTLINE :

The objective of the course is to impart the knowledge and understanding of causes and effects of air pollution and their controlling mechanisms. The course will provide a deeper understanding of air pollutants, pollution inventory and modelling. The course also imparts knowledge on the impacts of air pollution on different aspects such as policy, human health and various contemporary technological innovation for betterment of air quality.

ABOUT INSTRUCTOR :

Prof. Bhola Ram Gurjar holds a PhD in the area of Environmental Risk Analysis from India's premier technological institution I.I.T. Delhi followed by Postdoctoral research at the Max Planck Institute in Mainz (Germany). He is a Professor in Civil (Environmental) Engineering and Dean of Resources and Alumni Affairs at Indian Institute of Technology – IIT Roorkee. He has been Head of Centre for Transportation Systems (CTRANS) from 2015-2018. He has also headed the Max Planck Partner Group for Megacities & Global Change at IIT Roorkee from 2006-2011. Prof. Gurjar has about 30 years' progressive professional experience in industry, teaching, training, research, and consultancy. He is among the leading academics and researchers who have worked extensively in the area of environmental science and engineering specially focused on air and water pollution, and environmental quality and health risk assessment, which is reflected in his several highly cited research papers published on these themes. His present research interests include megacities; air and water pollution; environmental impact and risk assessment; atmospheric emissions and climate change; Biofuels and their emissions, and integrated cross-disciplinary study of science and policy issues of the environment, health, energy, economy, technology, infrastructure and resources – particularly from the global change, sustainable development and risk governance perspectives.

COURSE PLAN :

Week 1 : Air Pollution: Introduction and Impacts of air pollution on human health, vegetation, animals, building materials, structures, and atmosphere, soil and water bodies.

Week 2 : Sources, classification and formation/transformation of air pollutants: Meteorology and Atmospheric Stability.

Week 3 : Lapse Rate, Plume Behaviour, and Air Quality Monitoring, Air Quality Index (AQI)

Week 4 : Air Quality Modelling, Gaussian dispersion models: point, line and area source models

Week 5 : Emissions Inventory: Transport, Industrial, Agricultural, Residential and Commercial sectors

Week 6 : Application of Remote sensing/Satellite based data in emission inventory, Source apportionment using receptor modelling.

Week 7 : Indoor air pollution: sources, types and health impacts. Sampling, assessment and evaluation of Indoor air quality.

Week 8 : Global and regional environmental issues of air pollution: Ozone depletion, Climate change, Global warming, Acid rain.

Week 9 : Air pollution control devices, equipment and their design.

Week 10 : Air pollution emission standards, National and international policies, acts, rules and regulations.

Week 11 : Emerging technologies and strategies to mitigate air pollution, Current challenges and way forward.

Week 12 : Lab-based measurements of air pollutants.modelling