INTENDED AUDIENCE: 1. BTech/MTech/PhD students or faculties interested in acquiring knowledge of solar, wind and biomass renewable energy systems. 2. Chemical engineer/Mechanical engineer or Biosciences and Bioengineer designing renewable energy systems such as solar, wind and biomass systems. 3. Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories working in the area of energy engineering.


COURSE OUTLINE:
In this course an attempt has been made to standardize the course material and to emphasize on the fundamental of non-conventional energy sources (solar, wind, and biomass). Harnessing the energy through these sources using efficient technologies is expected to play an important role in serving as clean energy source for mankind.

ABOUT INSTRUCTOR:
Prof. Vaibhav V. Goud is Professor in the Department of Chemical Engineering, Indian Institute of Technology Guwahati, India since 2018. Principal research interests of Dr. Goud are in the fields of reaction engineering, renewable energy, supercritical fluids, bio lubricants. He has published more than 120 papers in international peer reviewed journals and made presentations of his research in several national/ international conferences. He has also written 14 book chapters in the area of renewable energy. He has taught energy resources as an elective course to UG, PG and Ph.D. students at IIT Guwahati for six consecutive years (2014, 2015, 2016, 2017, 2018 and 2019).

Prof. R. Anandalakshmi is an Associate Professor in the Department of Chemical Engineering, Indian Institute of Technology, Guwahati. Her research interests are in the area of Computational Heat Transfer and Fluid Flow, Process Modeling and Simulation, Solar Thermal Energy Conversion, Energy Efficient Design of Thermal Systems, Microwave Assisted Food and Material Processing, Food Packaging and Preservation, Refrigeration and Air-conditioning Systems

COURSE PLAN:
Week 1: Solar Energy: Basics and Concepts
Week 2: Concentrating and Non-concentrating Solar Collectors
Week 3: Thermal Energy Storage Systems and Solar Energy Utilization Methods
Week 4: Wind Energy: Basics and Concepts
Week 5: Characteristics and Power Generation from Wind Energy
Week 6: Biomass, Broad Classifications, Compositions, Characteristics, Properties, Structural Components
Week 7: Biomass Residues, Utilisation through Conversion Routes: Biological, Chemical and Thermo Chemical, Bioconversion into Biogas, Mechanism
Week 8: Bioconversion of Substrates into Alcohols, Thermo Chemical Conversion of Biomass, Conversion to Solid, Liquid and Gaseous Fuels, Pyrolysis, Gasification, Combustion, Chemical Conversion Processes