



**ST 201 Jan 3:0**

## **Thermochemical and biological energy recovery from biomass**

### **Instructor**

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### **Teaching Assistant**

Email:

**Department: Centre for Sustainable Technologies**

Course Time: Mon, Wed and Friday

Lecture venue: CST

Detailed Course Page:

## **Announcements**

### **Brief description of the course**

This course is focused to provide an insight into the biomass conversion processes for energy and by-products.

On specific request the final year UG environmental students are also allowed to credit.

The students are exposed to the physical and chemical properties of biomass and their influence on the conversion technology.

The thermo-chemical section provides an opportunity for the student to address the interaction between the reactants to yield various products. Aspects related equivalence ratio, adiabatic flame temperature, stoichiometry, pyrolysis, etc which are components of sub process are dealt in detail.

The biological conversion address the specific needs of the bio-chemical requirement and its dependence on the fuel composition. Hydrolysis a major sub-process addressing the soluble and insoluble components and

their initiation of reactions is addressed.

## **Prerequisites**

None

## **Syllabus**

Biomass and its properties relevant for conversion processes. Thermochemical energy conversion processes and devices – stoves, combustors and gasifiers for heat, power and co-generation applications. Biological conversion techniques, processes and reactors. Efficiency, emissions. performance of end use devices and resource recovery options.

## **Course outcomes**

This course in particular exposes the students towards addressing the energy conversion process for biomass for various outputs. The background acquired in this course will be a starting point for further research in the energy technologies or even bio-fuel programs.

## **Grading policy**

Tests - 10

Assignments - 15 %

Midterm 25 %

Final exam - 50 %

## **Assignments**

## **Resources**

Borman, G.L. and Ragland, K.W., Combustion Engineering, McGraw-Hill International Editions, Mechanical engineering

series.

HS Mukunda, Understanding clean energy and fuels from biomass, Wiley India

Relevant papers from current literature.