

JSPM'S
BHIVARABAI SAWANT INSTITUTE OF TECHNOLOGY &
RESEARCH, WAGHOLI, PUNE

4.1.3

4.1.3.1 ICT Enabled Classrooms and Seminar Halls

















D1-201



D1-202







D2-214



D1-311 (SH)



D2-203



D1-506



B2 203 ETC SH



D1 411 SH COMP





D1-207



B4 305







2. MATERIALS CREATED USING ICT

a. Sample PPT

b. Instant Notes Prepared Using Smart Interactive Board

c. Video Lecture Captured Using EASY CAPTURE TOOL of SMART BOARD . Link: <https://youtu.be/m4f4uwslhPA>



BHIVARABAI SAWANT INSTITUTE OF TECHNOLOGY & RESEARCH, WAGHOLI, PUNE

☆ Vision and Mission of Institute ☆

VISION

"Satisfy the aspirations of youth force, who wants to lead nation towards prosperity through techno-economic developments"

MISSION

"To provide, nurture and maintain an environment of high academic excellence, research and entrepreneurship for all aspiring students which will prepare them to face global challenges, maintaining high ethical and moral standard"



BHIVARABAI SAWANT INSTITUTE OF TECHNOLOGY & RESEARCH, WAGHOLI, PUNE


☆ Vision and Mission of Electrical Department ☆

VISION

" Human resource development to meet growing industrial & social challenges"

MISSION


"To impart quality education and nurture aspirants to face the growing challenges and satisfy stakeholders"



JSPM'S BSIOTR

A PRESENTATION ON BIOMASS ENERGY

-By
Prof. Mrutyunjay Patted
Department of Electrical Engg.



BIO MASS ENERGY SYSTEMS

WHAT IS BIOMASS??

- It refers to **SOLID CARBONECEOUS MATERIAL** derived from plants and animals.
- Biomass is 'CARBON CYCLE NEUTRAL'.

SOURCE OF BIOMASS??


- 90% of rural households, upto 15% urban dwellings

IMPORTANT OUTPUTS OF BIOMASS ENERGY-

- ETHENOL (C_2H_5OH)
- METHANOL (CH_3OH)

BIOMASS USAGE-

- Biomass>>directly via combustion to produce heat
- Biomass>>indirectly after converting it to various forms of bio fuel.




BIO MASS ENERGY SYSTEMS

RENEWABLE ENERGY SOURCE SENARIO IN INDIA
Installed Grid Interactive Renewable Power Capacity in India as of
March 31, 2017

Source	Total Installed Capacity (MW)	2022 target (MW)
Wind power	32279.77	60,000.00
Solar power	12288.83	100,000.00
Biomass power (Biomass & Gasification and Bagasse Cogeneration)	8182.00	*10,000.00
Waste-to-Power	114.08	
Small hydropower	4379.85	5,000.00
Total	57244.23	175,000.00

Maharashtra is generating 1220 MW of power from biomass energy which is the highest in the country.



BIO MASS ENERGY SYSTEMS

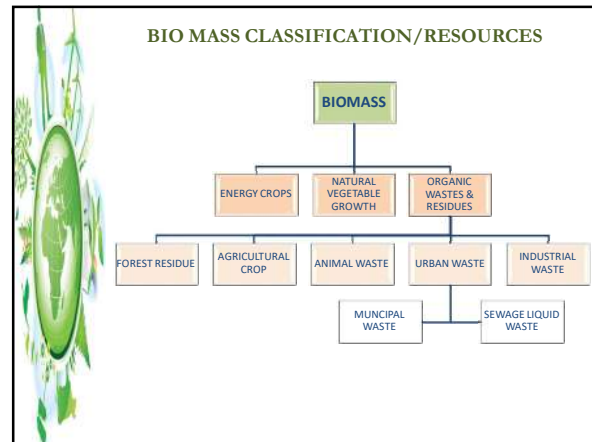
RENEWABLE ENERGY SOURCE SENARIO IN INDIA
Installed Grid Interactive Renewable Power Capacity in India as of
April 30, 2016

Source	Total Installed Capacity (MW)
Wind Power	26,866.66
Solar Power	6,762.85
Biomass Power (Biomass & Gasification and Bagasse Cogeneration)	4,831.33
Small Hydro Power	4,273.47
Waste-to-Power	115.08
Total	42,849.38

Maharashtra is generating 1220 MW of power from biomass energy which is the highest in the country.

BIOMASS RESOURCES

- Forests, Rural Farms, Urban Refuses and Organic Wastes From Agro-industries are the basic resources of Biomass
- **Resource in India-**
 - Our country Produces 550 million tonnes of agro-industrial residues every year.
 - 438 million tonnes of dung produced by 290 million cattles every year.



BIOMASS RESOURCES

FORESTS- are rich source of timber, fuel wood, charcoal

- Foliage & Logging Residues
- Fast growing trees like- Eucalyptus, Neem, kikar (babul), Gulmohar.

Calorific Value:
 Softwood foliage-4399 to 4977 kcal/kg
 Hard wood species- 3888 to 5219 kcal/kg

Agricultural Crop Residues-


- Rice husk, Wheat Straw, Corn Hubs
- Sugarcane bagasse, groundnuts, coconut shells
- All the above are converted into pellets and used to produce bio fuels.

Rice husk

Corn Cobs



Energy Crops-

- Refers to Fast growing plants
- Used for gaseous and liquid fuels like biogas, vegetable oil and alcohol
- Energy plantation have to be done in wastelands and water logged areas
- Cultivation of 'SUBABUL TREE' a energy plant with Cal.Value 4500kcal/kg founded by Biomass Research Centre Lucknow
- MNRE is promoting Energy Farming in 9 different agro climate regions across india



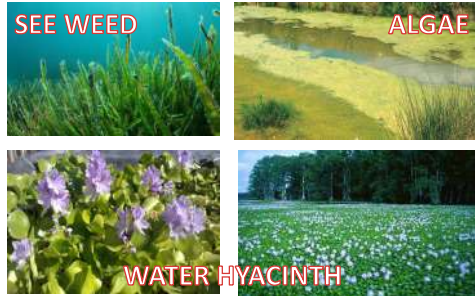

Vegetable Oil Crops-

- Sunflower, Cotton seeds, groundnuts, palm and coconut
- Oil produced from above plants after purification blended with diesel oil and used as engine oil
- '**JAJOBA**' an arid area shrub, cultivated in Rajasthan, Gujarat and Orissa.
- Jajoba oil is used as transformer oil because of its good insulating property
- Used as raw materials for paints and Varnishes


Aquatic Crops(Water Plants)

- Algae, water hyacinth, sea weed – rich sources of organic matter for biogas

Animal Wastes-

- An organic material with combustible property
- Rich source of fuel
- Dung cakes are important resources used in biogas plants




Urban Waste-


- Mainly its of 2 types- **Municipal Solid Waste (MSW), Liquid Waste**
- **MSW**-human excreta, household garbage and commercial wastes
- **LW**-domestic sewage and effluents from institutional activities
- As per MNRE,
MSW-42 Million Tonnes every year
LW-6000m³ every year



MSW




LIQUID WASTE


Industrial Wastes-

- Energy Recovery from Ind.Waste was Taken up in 1994
- Pulp and Paper Industry effluent
- Starch and Glucose Industry Waste
- Palm oil Industry, Distillery Waste
- Tanneries Waste




BIO FUELS

- Direct burning produce less heat and also discharges smoke which is a health hazard
- To harness fuel value, biomass converted into biofuel (solid, liquid, gaseous form)
 - CHARCOAL-75 to 80% carbon
 - BRIQUETTS-densification product
 - VEGETABLE OIL-Jajoba oil




BIOGAS

- Produced by digestion of plant, animal and human wastes
- It is a mixture of –
 - CH₄ (55 to 65%)
 - CO₂ (30 to 40%)
 - H₂, H₂S and N₂ (<10%)
- CALORIFIC VALUE= 5000 TO 5500 kcal/kg




Liquid Fuel (ETHANOL)

- Produced by fermentation of any feedstock contains sugar or starch or cellulose material.
- Sugar resources- sugar beets, sugar canes, wheat, cassava, & potato
- Cellulose- plant tissues, wood, solid wastes & agri residues
- *Ethanol is used with petrol and diesel to reduce CO and Smog causing emissions*




BIOMASS CONVERSION TECHNOLOGIES

1. DENSIFICATION
2. COMBUSTION AND INCINERATION
3. THERMO CHEMICAL CONVN- *Pyrolysis, Gasification, Liquefication*
4. BIO-CHEMICAL CONVN- *Anaerobic Digestion, Ethanol Fermentation*



BIOMASS CONVERSION TECHNOLOGIES

1. DENSIFICATION
 - Reduction to better volume to weight ratio
 - By compressing in a die at a high temp and pressure
 - To form- Pellets and Briquettes
 - Advantage-
 - Easier to Transport and Store
 - Clean fuel for chulhas, bakeries and hotels



BIOMASS CONVERSION TECHNOLOGIES

2. COMBUSTION AND INCINERATION
 - Combustion:** Biomass is burnt to produce heat utilized for cooking, space heating etc
 - Inefficient method – 30-90% energy loss
 - Incineration:** Complete burning of biomass to ashes by high temp oxidation
 - Incineration is special combustion process for MSW.
 - Capacity : 1000tonnes/day

BIOMASS CONVERSION TECHNOLOGIES

3. Thermo Chemical Conversion

•Decomposing biomass with various combinations of temperatures, pressures and chemicals

•**Pyrolysis:** Heating biomass in the absence of oxygen or partial use of oxygen.

•**Pyrolysis** produce **HYDROCARBON** (Mixture of H_2 , CO_2 , CO , CH_4), an oil like liquid and carbon rich solids.

•**Gasification:** Conversion of biomass to Gaseous fuels (with temp and controlled air)

•Output gas- a producer gas (H_2 , CO_2 , CO , CH_4 , N_2).

•Gases can be burnt to produce heat and steam

BIOMASS CONVERSION TECHNOLOGIES

4. BIOCHEMICAL CONVERSION

*Anaerobic Digestion/Fermentation

1. Organic Material \rightarrow hydrolyzed \rightarrow fatty acids, alcohols, sugars, H_2 and CO_2

2. Outputs of 1 \rightarrow methane forming bacteria \rightarrow CH_4 and CO_2

3. Occurs in Sealed tank called **DIGESTER**

4. **Major inputs-** Cattle dung, human wastes, other organic waste with high moisture

BIOMASS CONVERSION TECHNOLOGIES

4. BIOCHEMICAL CONVERSION

*Ethanol (C_2H_5OH) Fermentation

1. **BIOMASS** (contains sugar) \rightarrow glucose ($C_6H_{12}O_6$) & sucrose ($C_{12}H_{22}O_{11}$)

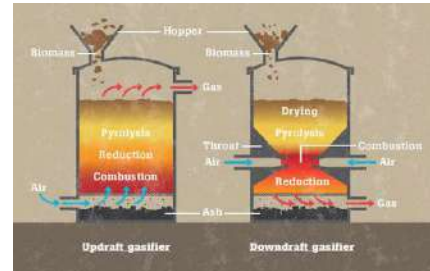
2. $C_{12}H_{22}O_{11} + H_2O \rightarrow 2C_6H_{12}O_6$

2. $C_6H_{12}O_6 \rightarrow$ fermentation $\rightarrow 2C_2H_5OH + 2CO_2$

GASIFIERS

FIXED BED TYPE

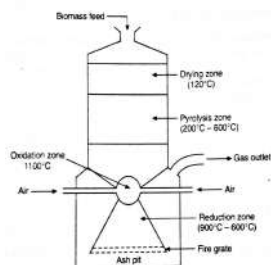
1. Updraft and Down Draft



GASIFIERS

FIXED BED TYPE

1. Down Draft



GASIFIERS

FIXED BED TYPE

Reactions involved

1. Moist BM + HEAT \rightarrow DRY BM + WATER VAPOUR

2. $C + O_2 \rightarrow CO_2$ [combustion]

3. $C + H_2O \rightarrow CO + H_2$ [water gas reaction]

4. $CO + H_2O \rightarrow CO_2 + H_2$ [water shift reaction]

5. $C + CO_2 \rightarrow 2CO$

6. $C + 2H_2 \rightarrow CH_4$ [hydrogenation reaction]

Modified Euler's Method.

$$y_{ME} = y_0 + \frac{h}{2} \left[f(x_0, y_0) + f(x_1, y_1) \right]$$

$$y_1 = y_E = y_0 + h f(x_0, y_0)$$

- ① Euler's method. - y_E
- ② M.E. Method - y_{ME1}
- ③ M.E. method - corrector formula - y_{ME2}
- ④ ACC: $y_{ME1} - y_E$, $y_{ME2} - y_{ME1}$

$$P1) \frac{dy}{dx} = \sqrt{x+y}$$

$$\begin{array}{ccc} x & 1 & 1.1 \\ y & 2.2 & 2.38275 \end{array} \quad \begin{array}{c} 1.2 \\ \\ \end{array}$$

$$h = \frac{x_{e1} - x_0}{n-2} = 0.1$$

Itn ①: MEM

$$y'_{MEM} = y_0 + \frac{h}{2} \left[f(x_0, y_0) + f(x_1, y_{e1}) \right]$$

$$\begin{aligned} \therefore y_{e1} &= y_0 + h f(x_0, y_0) \\ &= 2.37889 \end{aligned}$$

-1,

$$\begin{aligned} f(x_0, y_0) &= f(1, 1.2) \\ &= \sqrt{1+2.2} \\ &= 1.78885 \end{aligned}$$

$$\text{Now } y'_{m\varepsilon 1} = 2.2 + \frac{0.1}{2} \left[\begin{array}{l} 1.78888 \\ + 1.86518 \end{array} \right] \left| \begin{array}{l} f(x_1, y_{\varepsilon 1}) = \sqrt{1.1 + 2.37889} \\ = 1.86518 \end{array} \right.$$

$$y'_{m\varepsilon 1} = 2.38270$$

$$\text{ACC: } y_{m\varepsilon 1} - y_{\varepsilon 1} = 0.00381 > 0.0001 \quad \therefore \text{AC.Nt.Sati.}$$

$$2) \quad y'_{m\varepsilon 2} = y_0 + \frac{h}{2} \left[f(x_0, y_0) + f(x_1, y'_{m\varepsilon 1}) \right]$$

$$y'_{m\varepsilon 2} = 2.38275$$

$$\text{ACC: } y'_{m\varepsilon 2} - y'_{m\varepsilon 1} = 0.00005 < 0.0001$$

Hence $y_1 = 2.38275$ at $x_1 = 1.1$

Itm(2):

$$1) y_{m\epsilon 1}^2 = y_1 + \frac{h}{2} \left[f(x_1, y_1) + f(x_2, y_{\epsilon 2}) \right]$$

$$y_{\epsilon 2} = y_1 + h f(x_1, y_1)$$

$$y_{\epsilon 2} = 2.56935$$

$$y_{m\epsilon 1}^2 = 2.57313$$

$$\text{Acc: } y_{m\epsilon 1}^2 - y_{\epsilon 2}$$

$$= 0.00378 > 0.0001$$

= A.N. Satisfied.

$$2) \quad y_{m\epsilon 2}^2 = y_1 + \frac{h}{2} \left[f(x_1, y_1) + f(x_2, y_{m\epsilon 1}^2) \right]$$

$$y_{m\epsilon 2}^2 = 2.57318$$

$$\text{ACC: } 0.00005 < 0.0001 \quad \checkmark$$

Hence The value of $y_2 = 2.57318$ at $x_2 = 1.2$

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DETAILS OF LMS

LMS FACILITY: MOODLE (Modular Object Oriented Dynamic Learning Environment)

LINK FOR LMS: 114.143.162.61/bsiotr

To create and enhance the digital teaching-learning environment, Moodle Platform has been incorporated.

STEPS INVOLVED, TO DEVELOP AND PROVIDE THE DIGITAL LEARNING MATERIALS.

- **Creation of Course for the respective academic year**
- **Allocation of Teacher and Students for the respective course**
- **Development of the course materials by the teacher for the respective subjects such as Notes, PPT, Assignments, Online Quizzes (MCQs), and Interactive videos using smart tools provided in MOODLE.**
- **Providing access to the respective students once the development of Course materials are completed.**

ACTIVITIES/TASK ON MOODLE

- **Online Assignment Submission**
- **Monthly MCQ Pre-Online Test**

JSPM's Bhivarabai Sawant Institute of Technology and Research, Pune

Home Dashboard Events My Courses

ANNOUNCEMENTS [Click here to Access JSPM-TSSM NPTEL Streaming Server.](#)

Main menu

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- Funding Agendas

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Course categories

- Department of Computer Engineering
 - SE
 - AY-2016-17
 - AY-2017-18
 - TE
 - BE
- Department of Electrical Engineering (a)
- Department of Electronics & Telecommunication (a)
- Department of Information Technology
- Feedback Management System (a)

Course: High Voltage Engi ...

Home Dashboard Events My Courses This course Turn editing on Hide blocks Standard view

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VISION AND MISSION

VISION AND MISSION OF THE INSTITUTE

- VISION:** Satisfy the aspirations of youth force, who wants to lead nation towards prosperity through techno-economic developments
- MISSION:** To provide, nurture and maintain an environment of high academic excellence, research and entrepreneurship for all aspiring students which will prepare them to face global challenges, maintaining high ethical and moral standard

VISION & MISSION OF THE DEPARTMENT

- VISION:** Human resource development to meet growing industrial & social challenges
- MISSION:** To impart quality education and nurture aspirants to face the growing challenges and satisfy stakeholders

Course: High Voltage Eng. X

114.143.162.61/bsiotr/course/view.php?id=501

- Unit-5 Generation of High Voltages and Current
- Unit-6 High Voltage Testing of Electrical Apparatu...
- SG-8C-8-17-8
- ELECTRICAL DRIVE-A COMMON STORAGE OF RILES
- TRAINING AND PLACEMENT CELL
- Online Exam Practice-Electrical
- IA 2017
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- Department of Electronics & Telecommunication
- Department of Information Technology
- Feedback Management System
- Quality Assurance
- Department of Mechanical Engineering
- Department of Engineering Science
- Training and Placement
- Lab Maintenance System

Search forums

Go



Advanced search

Upcoming events

There are no upcoming events

Unit-01 Breakdown in Gases:

- UNIT-01 Breakdown of Gases
- Assignment-01
- Knowledge Wall on Ionization Process
- Knowledge Wall on Ionization Process
- ppt on breakdown of gases
- May Jun 2017 (2)

Unit-2. Breakdown in Liquid Dielectrics:

Course: Manufacturing - X

114.143.162.61/bsiotr/course/view.php?id=835

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- AY-2017-18
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- BE

MACHINE TOOLS AND THEIR APPLICATIONS

- Assignment No.1
- PPt Units-1
- UNIT 1 MCQ
- MINI PROJECT
- NPTL VIDEO Link
- MOOC LINK
- LIST OF Video clip
- List of Provision Made for Self-Study
- List of Industries
- List of IS STD:
- List of MINI Projects
- competition unit-1
- Debate Topics
- Question bank unit -1
- List of case studies

Assignments

114.143.162.61/bsictr/mod/assign/index.php?id=688

Power System Operati ...

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Courses > Department of Electrical Engineering > BE > AY-2017-18 > Semester-I > BE-A > PSOC-A DIV > Assignments

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Assignments

Topic	Assignments	Due date	Submission	Grade
	ASSIGNMENT1	-	50	-
	ASSIGNMENT2	Thursday, 28 September 2017, 12:00 AM	50	-
	ASSIGNMENT3	Thursday, 28 September 2017, 12:00 AM	50	-
	ASSIGNMENT4	Thursday, 28 September 2017, 12:00 AM	50	-
	ASSIGNMENT5	Thursday, 28 September 2017, 12:00 AM	50	-
	ASSIGNMENT6	Thursday, 28 September 2017, 12:00 AM	49	-

Quizzes

114.143.162.61/bsictr/mod/quiz/index.php?id=783

Principles of Progra ...

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Quizzes

Topic	Name	Quiz closes	Attempts
	unit 1 and unit 2 quiz	Monday, 2 April 2018, 2:59 PM	Attempts: 68
	Unit 3 & unit 4 quiz		Attempts: 70
Unit I - Programming Language Syntax and semantics	Unit 1 MCQs		Attempts: 4
Unit II - Structuring the Data, Computations and Program	Unit 2 MCQs		Attempts: 1
Unit III - Structuring of Program	Unit 3 MCQ		Attempts: 4
Unit IV - Java as Object Oriented Programming Lang - Overview	Unit 4 MCQs		Attempts: 1
Unit V - Inheritance, Polymorphism, Encapsulation using Java	Unit 5 MCQs		
Unit VI - Exception Handling in Java	Unit 6 MCQs		

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Topic	Name	Content Type
Unit I : General Aspects of Control System	Signal Flow Graph	Interactive Video
Unit II : Time domain analysis	Steady State Error Calculation	Interactive Video
Unit III : Stability analysis and Root Locus	Routh's Hurwitz Stability Criterion	Interactive Video