

CERTIFICATE COURSE

Approved By,

Rajarambapu college of Sugar Technology, Islampur

1	Name of Course	Certificate course in Sugar Engineering																											
2	Max. No's of Student	15 Students																											
3	Duration	1 Year(6 Months Theory+ 6 Months In plant Training)																											
4	Type	Part Time																											
5	No's Of Days / Week	5 Days																											
6	No Of Hours Per Day	3 Hrs																											
7	Space Required	Class Room = 200 Sq. Feet																											
8	Admission Eligibility	Diploma in Mechanical /production/Electrical/instrumentation Engg...																											
9	Objective Of Course	To Provide the Training to the Enggs. Regarding the sugar industry working.																											
10	Employment Opportunity	Sugar and Allied industry																											
11	Teacher's Qualification	BE,ANSI(Sugar Engg.),Or Diploma Mech./Elec. Engg Plus Certificate Course in VSI of sugar engg.																											
12	Training System	Training System Per Week																											
		Theory	In-Plant Visit	Total																									
		15 hrs	6 hrs	21 hrs																									
13	Exam. System	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Sr.no</th> <th style="text-align: center;">Subject</th> <th style="text-align: center;">Th/Pr</th> <th style="text-align: center;">Hours</th> <th style="text-align: center;">Max.Marks</th> <th style="text-align: center;">Min.Marks</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Extraction of Juice (Milling)</td> <td style="text-align: center;">TH</td> <td style="text-align: center;">3</td> <td style="text-align: center;">100</td> <td style="text-align: center;">35</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Generation of Steam(Boiler)</td> <td style="text-align: center;">TH</td> <td style="text-align: center;">3</td> <td style="text-align: center;">100</td> <td style="text-align: center;">35</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">Generation Of Power.(Power Turbine)</td> <td style="text-align: center;">TH</td> <td style="text-align: center;">3</td> <td style="text-align: center;">100</td> <td style="text-align: center;">35</td> </tr> </tbody> </table>				Sr.no	Subject	Th/Pr	Hours	Max.Marks	Min.Marks	1	Extraction of Juice (Milling)	TH	3	100	35	2	Generation of Steam(Boiler)	TH	3	100	35	3	Generation Of Power.(Power Turbine)	TH	3	100	35
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3	Generation Of Power.(Power Turbine)	TH	3	100	35																								

		4	Inplant Training			
			a)Project		200	100
			b)Seminar	DPR	50	25
			c)ViVa		50	25
			Total		600	255

Syllabus

1 Subject Name: Extraction of Juice (Milling)

Cane handling and feeding

- Cane unloading -Bridge with trolley- having sling bar system-two motion.
- Feeder table-size, slope, chain, breaking strength .power consumption etc
- Cane carrier-horizontal & inclined carrier length. . Width of carrier, Speed of carrier, capacity of carrier, power consumption of carrier. Type of carrier 1) Split cane carrier.2) Rake carrier, 3) Belt carrier.

Cane preparations

- Preparation of cane,
- various device of cane preparation like chopper, leveler, fibrizer and shredder.
- Measurement of preparation index by bulk density method, sieving method, leaching method.

Mills and mill components

- Conventional mill.
- Mill Headstocks.
- Mill rollers& rollers grooving,
- Messchaert groove,
- lotus roller,
- Mill hydraulic and loading.
- Mill bearing,-
- Mill pinion
- Trash & Scrapper plate,
- Mill drives& Mills setting and Imbibitions
- Mill drive power requirement, Prime movers for mills, Mill gearing, Mill couplings and tail bars

- Roller setting, pressure feeder setting; underfeed roller setting, chute opening, trash plate setting, practical optimization of mill setting.

Imbibitions

- Object of imbibitions.
- Type of imbibitions
- Hot and cold water for imbibitions.. Its Merit and demerit
- Imbibition control system.

Reference Book.

- 1] Hand book of cane sugar :E.Hugot
 - 2] Cane sugar engineering:Peter Rain.
 - 3] Machinery & equipments of sugar factory :L.A.Tromp
 - 4] cane sugar hand book R.B.L.Mathur
 - 5] Modern milling of sugar cane :M axwell
 - 6] standard fabrication practices of cane sugar mill Delden.
 - 7] the energy cane alternative, Alexander
- Cane sugar manufacturing in India D.P.Kukkarni

2.Subject Name: Generation of Steam(Boiler)

:Steam Generation: (Boiler)

- Properties of steam,
- Fuels (Bagasse) , characteristics of Bagasse, combustion Bagasse,
- Furnaces (Spreader Stoker & Travelling Grate),
- Boiler, Super heater, Economizer, Air preheated,
- Boiler accessories –feed water tank I.D.&F.D fans Chimney ,electrostatic participator etc

Boiler Instrumentation & Control

- Various flow meter to measured flow like steam, feed water
- Level indicator for Drum water.
- Pressure indicator for steam pressure,
- Temperature indicator for various points. All these points to be connected to data logger for recording

Boiler water treatment

- Use of condensate.
- Feed water specification and treatment (Internal & External),
- DM & RO Plants, analytical control,

3.Subject Name: Generation Of Power.(Power Turbine)

Power generation

- Classification – description & working of extraction & condensing type turbines,
- specific steam consumption

Alternator

- sugar factory requirements, – size, type, efficiency,
- 3 phase AC generation, and power transmission system.

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4. In-Plant Training: In sugar factories during season (Engineering section)

A] PROJECT.

a)Introduction:

Factory- Organization structure, Function of all Departments, No of employees in each department, Detail flow chart of Sugar Factory.

b) Milling:

Technical Specifications Of cane handling and Cane Preparing device, Working and Operation of Cane handling and cane Preparing Device, Working of Mills, Size of Mill, RPM of Mill, Hydraulic Load Of Mill, Roller Grooving, Mill Setting, Lubricant System etc..Imbibitions System, Brix Curve and its significance, Pumping of juice, Piping Details. Juice Screening arrangement, Juice Weighing arrangement.

c)Boiler:

Technical Details Of Boiler ,Fuel Management, Boiler Operation, Water level and control, Boiler Pressure, Make Up Water, Working of DM and RO Plant, Blow Down System, Economizer, Preheated, Air heater, ID and FD fan, SA fan, RBC working.

Starting of Boiler, Slow Firing, Rising to the Pressure, Pressure maintenance, Low boiler Pressure, Back Feeding, Water High/Low Level, Operational Problem, Instrumentation For Water Level, Boiler Pressure and Temperatures.

d)Power House:

Turbine, Alternator, AVR Load Distributor, Turbine Heating, Turbine change Over, Power Factor Maintenance, Steam Consumption, Solving the Problem like Priming, Low Boiler Pressure, Power Production and Distribution, Co Generation station.

e) Student Need to Visit all above sections and Prepared the Detail Project report of Factory which consist of Milling Station, Boiler and Turbine Sections. This

report may include various process carried out in boiling house right from juice weightment to sugar packing.

B) workshop/seminar Group of students shall arrange workshop/seminar any topic of above 3 sections.

C) VIVA Students have appeared for VIVA at the time of submitting the Project.