

NATIONAL SUGAR INSTITUTE

Kanpur

COURSE : CERTIFICATE COURSE IN QUALITY CONTROL 2014-15			
DURATION OF CLASS : JULY TO OCTOBER (12 WEEKS)			
SUBJECT : SUGAR TECHNOLOGY (THEORY) ; CODE : CQ/101			
UNIT No.	<u>CONTENTS</u>	No. of periods for lecture , assignments & class tests	Review by the Faculty as on _____
1	1. Composition of sugar cane. 2. Composition of sugar cane juice. Introduction to terminology used in Sugar Industry 3. Process flow diagram of Double Sulphitation process and refined sugar process. 4. Clarificants used in processing. 5. Brief details of various unit operations such as Milling, Clarification, heating, Evaporation, Pan Boiling (Crystallization), Centrifugation and bagging 6. Role of reducing sugars, phosphate and calcium content during the processing of sugar cane juice 7. BIS standards for plantation white and other sugars, FSSAI standards, Sugar grade as issued by Bureau of Sugar Standard, 8. Measurement of colour of Sugar in Solid Phase (Modulated Reflectance Value) 9. SO ₂ Content in Sugar: Total and free SO ₂ in sugar, Limit of SO ₂ in sugar, Determination of SO ₂ by Iodine and p-rosanaline hydrochloride Method. (Sugar Technology Division)	24	
2	Steam Generation, Water treatment and availability of condensate. Boiler Water Treatment: Specification of Boiler water, pH, conductivity, Acidity and Alkalinity of boiler water, Scale formation, Corrosion, Condensate Treatment. (Sugar Engineering Division)	12	
3	Idea about ISO Certification, NABL accreditation and Good Laboratory Practices etc. (Guest Faculty)	0	

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UNIT No.	<u>CONTENTS</u>	No. of periods for lecture , assignments & class tests	Review by the Faculty as on _____
4	<p>1. Colour: Colourimetry, Lambert Beer's Law, Determination of λ_{\max}, Measurement of colour of Sugar in solution Phase by GS9/1/2/2-8 (MOPS Method), GS9/1/2/2-9 (TEA Method) and GS9/1/2/2-10 (ISO Grade water Method),</p> <p>2. Conductivity: Specific Conductance, Molar Conductance and Equivalent Conductance and factors affecting them, Measurement of Conductivity ash.</p> <p>3. Turbidity: Concept of Turbidity, reason for appearance turbidity, Method of determination of turbidity by Turbidity-meter.</p> <p>4. Analytical Chemistry: Concept of Mole, Normality, Molarity, Molality, Formality, ppm, ppb, ppt, Mole Fraction and Equivalent weight (Physical Chemistry Division)</p>	24	
5	<p>1. Total Reducing Sugar: Reducing Sugars, Non- Reducing Sugars, Total Reducing Sugars, Fehling-A and Fehling-B solutions, Method for determining TRS.</p> <p>2. Molasses: Molasses, Grades of Molasses, Types of molasses, Method for determining TRS in molasses.</p> <p>3. BOD and COD: Dissolved Oxygen, Biological Oxygen Demand, Chemical Oxygen Demand, Determination of BOD and COD in effluent. (Biochemistry Division)</p>	12	
	TOTAL	72	

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DURATION OF CLASS : JULY TO OCTOBER (12 WEEKS)			
SUBJECT : SUGAR TECHNOLOGY CHEMICAL CONTROL ; CODE : CQ/102			
UNIT No.	<u>CONTENTS</u>	No. of periods for lecture , assignments & class tests	Review by the Faculty as on _____
1	<ol style="list-style-type: none"> 1. Determination of Pol % cane 2. Mill Extraction (M.E.) 3. Reduced Mill Extraction (R.M.E.) 4. SJM Formula 5. Reduced Boiling House Recovery (R.B.H.R.) 6. Brix Curve 7. Pol Balance 8. Brix Balance 9. Non Sugar Balance 10. Calculation of Recovery etc. 11. Actual vs. theoretical molasses % cane 12. Actual Vs Theoretical molasses % cane 	72	
	TOTAL	72	

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COURSE : CERTIFICATE COURSE IN QUALITY CONTROL 2014-15			
DURATION OF CLASS : JULY TO OCTOBER (12 WEEKS)			
SUBJECT : SUGAR TECHNOLOGY (PRACTICAL) ; CODE : CQ/103			
UNIT No.	<u>CONTENTS</u>	No. of periods for lecture , assignments & class tests	Review by the Faculty as on _____
1	<ol style="list-style-type: none"> 1. Brix / Pol / Purity of juice/molasses/masseccuite and other sugar house products 2. Sucrose %, P₂O₅, CaO Content in mixed juice and clear juice etc 3. Crystal % masseccuite 4. Size & shape of crystal 5. Moisture % sugar 6. Pol and Moisture % Bagasse 7. Pol % Press cake 8. Preparatory Index of cane 9. Determiation of Total and free SO₂ content in sugar by Iodine and p-rosanaline hydrochloride (Sugar Technology Division) 	72	
2	<ol style="list-style-type: none"> 1. Measurement of colour of sugar in solution phase by GS9/1/2/2-8, GS9/2/2/2-9 and GS9/1/2/2-10 method. 2. Measurement of Conductivity ash in sugar by ICUMSA Method. 3. Determiation of turbidity in sugar by Turbidity-meter and calibration of Turbidity meter. 4. Determiation of pH of sugar solution by pH-meter and calibration of pH meter. 5. Determiation of specific conductivity of sugar solution by Conductivity-meter and calibration of Conductivity-meter. 6. Determiation of conductivity-ash of sugar solution by ICUMSA method. 7. Preparation and standardization of solutions of different concentration. (Physical Chemistry Division) 	36	

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UNIT No.	<u>CONTENTS</u>	No. of periods for lecture , assignments & class tests	Review by the Faculty as on _____
3	1. Determination of RS and TRS in Molasses. 2. Determination of BOD and COD in effluent. 3. DO in feed water, boiler water, blow down water and various condensate. (Biochemistry Division)	36	
4	1.TSS, 2.TDS, 4. Hardness, 5.Silica content, 6.Phosphate in feed water, boiler water, blow down water and various condensate. (Agriculture Chemistry Division)	36	
	TOTAL	180	