

# NATIONAL SUGAR INSTITUTE

MINISTRY OF CONSUMER AFFAIRS, FOOD & PUBLIC DISTRIBUTION  
DEPARTMENT OF FOOD & PUBLIC DISTRIBUTION

Government of India  
KANPUR



सत्यमेव जयते

ACADEMIC BULLETIN- 2018

For

**CERTIFICATE COURSE IN  
QUALITY CONTROL  
(C.C.Q.C.)**

# CERTIFICATE COURSE IN QUALITY CONTROL

## ACADEMIC CALENDAR

1.	<b>Admission</b>	<b>July-2018</b>
2.	<b>Theory &amp; Practical Classes</b>	<b>July-2018 to October - 2018</b>
3.	<b>Events organized by Games &amp; Sports, Cultural, Scientific Society</b>	<b>August/ September-2018</b>
4.	<b>Examination</b>	<b>NOVEMBER - 2018</b>
5.	<b>Campus Interview through placement cell</b>	<b>As per the demand and Convenience of the industry.</b>

- Note:** 1. The working of the Institute is from Monday to Friday i.e. five days in a week.
2. The Institute also observed holidays for Central Government Offices in Kanpur.

## 1. RULES FOR ATTENDANCE AND LEAVE

- 1.1 A student is required to put in a minimum of 75 percent attendance during each session in each subject. Non-compliance of this rule will render him liable to be debarred from appearing at the Diploma Examination.
- 1.2 Ordinarily, leave for 15 days in admissible to a student is an academic year.
- 1.3 Application of leave for absence must be handed over at the Education Section on the prescribed form.
- 1.4 Application for leave must be counter signed by the Hostel Warden or the approved guardian.
- 1.5 Application for Sick leave must be accompanied by a certificate from the Medical Officer of the Hostel.
- 1.6 Absence without leave by a student drawing a scholarship may result in the cancellation or reduction of his scholarship.

## 2. RAGGING : *Ragging is strictly prohibited vide directions of Hon'ble Supreme Court in SLP No2495 of 2006 dated 16.05.2007 and in Civil Appeal No 887 of 2009, dated 08.05.2009. Any student found guilty of ragging and /or abetting ragging is liable to be punished.*

## 3. SCHEME OF EXAMINATIONS

- 3.1 The examinations are held at the appropriate time as per Institute's calendar. Class tests may also be held during the middle of the session. Marks obtained at these tests and examinations as well as the marks assigned for class work and lecture notes of each student will be recorded for his class marks in each term.

### 3.2 Classification of Results:

It is necessary to pass in each subject separately in Theory and Practical .The minimum pass marks in theory 35% and 50% in Practical. The candidate would be declared to have passed a particular course in case he secures a minimum of 50% marks in aggregate. The division to students at the end of examinations are given according to the following standards:-

First Division	.	.	.	.	.	75% and above
Second Division	.	.	.	.	.	60% and above
Third Division	.	.	.	.	.	50% and above

### 3.3 Supplementary Examination

- 3.3.1 If a candidate fails in maximum of any two subjects at the First/Second/Final year examination but secures 50% marks in aggregate, he will be allowed to appear in the supplementary examination for these two subjects.

3.3.2 A candidate allowed to appear in the supplementary examination would be provisionally promoted to the next higher class and in case he fails in the supplementary examination also, he would be reverted to the lower class on declaration of supplementary examination results.

3.3.3 The student who passes in the said examination of any course in supplementary examination will be declared as “PASSED” and no division will be awarded to him.

### 3.4 Re-admission of Failed Students

If a candidate fails in First/Final year examinations (including supplementary examination). He/she will be permitted to take the re-admission again in the following year, provided he/she attends the Institute as a regular student in the same class in which he/she had failed. If a student fails three times in a particular class he will be not re-admitted in that class in the Institute. If after failing in the class once a candidate does not take re-admission in the same class in the immediate next session his/her case will not be considered in future for re-admission.

3.5 **Schedule of marks:** The schedule of marks for different subjects for the examination is as follows.

#### EXAMINATION IN NOVEMBER

Subject	Maximum Marks
<b>THEORY</b>	
Sugar Technology . . . . .	100
Sugar Technology- - 50	
Sugar Engineering- - 15	
Bio Chemistry - -15	
Physical Chemistry- -20	
Sugar Technology (Chemical Control) . . . . .	100
<b>PRACTICAL</b>	
Sugar Technology . . . . .	200
Sugar Technology- - 80	
Bio Chemistry - -40	
Physical Chemistry- -40	
Agriculture Chemistry -40	
<b>SESSIONAL</b>	
Class marks	100
<b>GRAND TOTAL</b>	<b>500</b>

**SYLLABUS**  
**CERTIFICATE COURSE IN QUALITY CONTROL**  
**(C.C.Q.C.)**

**SUBJECT** : SUGAR TECHNOLOGY (THEORY)

**CODE** : CQ/101

**Maximum Marks :100**

- 
1. Composition of sugar cane. Composition of sugar cane juice. Introduction to terminology used in Sugar Industry
  2. Process flow diagram of Double Sulphitation process and refined sugar process.
  3. Clarificants used in processing.
  4. Brief details of various unit operations such as Milling, Clarification, heating, Evaporation, Pan Boiling (Crystallization), Centrifugation and bagging
  5. Role of reducing sugars, phosphate and calcium content during the processing of sugar cane juice
  6. BIS standards for plantation white and other sugars, FSSAI standards, Sugar grade as issued by Bureau of Sugar Standard,
  7. Measurement of colour of Sugar in Solid Phase (Modulated Reflectance Value)
  8. SO<sub>2</sub> Content in Sugar: Total and free SO<sub>2</sub> in sugar, Limit of SO<sub>2</sub> in sugar, Determination of SO<sub>2</sub> by Iodine and p-rosanaline hydrochloride Method.
- 2**
- (i) Steam Generation, Water treatment and availability of condensate.
  - (ii) **Boiler Water Treatment:** Specification of Boiler water, pH, conductivity, Acidity and Alkalinity of boiler water, Scale formation, Corrosion, Condensate Treatment. (Sugar Engineering Division)
- 3**
- (i) Idea about ISO Certification, NABL accreditation and Good Laboratory Practices etc.
- 4**
- (i) Colour: Colourimetry, Lambert Beer's Law, Determination of  $\lambda_{\max}$ , 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),
  - (ii) Conductivity: Specific Conductance, Molar Conductance and Equivalent Conductance and factors affecting them, Measurement of Conductivity ash.
  - (iii) Turbidity: Concept of Turbidity, reason for appearance turbidity, Method of determination of turbidity by Turbidity-meter.
  - (iv) Analytical Chemistry: Concept of Mole, Normality, Molarity, Molality, Formality, ppm, ppb, ppt, Mole Fraction and Equivalent weight  
(Physical Chemistry Division)

- 5**
- (i) Total Reducing Sugar: Reducing Sugars, Non- Reducing Sugars, Total Reducing Sugars, Fehling-A and Fehling-B solutions, Method for determining TRS.
  - (ii) Molasses: Molasses, Grades of Molasses, Types of molasses, Method for determining TRS in molasses.
  - (iii) BOD and COD: Dissolved Oxygen, Biological Oxygen Demand, Chemical Oxygen Demand, Determination of BOD and COD in effluent.

**SUBJECT : SUGAR TECHNOLOGY (CHEMICAL CONTROL)**

**CODE : CQ/102 Maximum Marks :100**

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

**SUBJECT : SUGAR TECHNOLOGY (PRACTICAL)**

**CODE : CQ/103**

**Maximum Marks :200**

**Sugar Technology Division**

- (i) Brix / Pol / Purity of juice/molasses/masseccuite and other sugar house products
- (ii) Sucrose %,  $P_2O_5$ , CaO Content in mixed juice and clear juice etc
- (iii) Crystal % masseccuite
- (iv) Size & shape of crystal
- (v) Moisture % sugar
- (vi) Pol and Moisture % Bagasse
- (vii) Pol % Press cake
- (viii) Preparatory Index of cane
- (ix) Determination of Total and free  $SO_2$  content in sugar by Iodine and p-rosanaline hydrochloride

**Physical Chemistry Division**

- (i) 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.
- (ii) Measurement of Conductivity ash in sugar by ICUMSA Method.
- (iii) Determination of turbidity in sugar by Turbidity-meter and calibration of Turbidity meter.
- (iv) Determination of pH of sugar solution by pH-meter and calibration of pH meter.
- (v) Determination of specific conductivity of sugar solution by Conductivity-meter and calibration of Conductivity-meter.
- (vi) Determination of conductivity-ash of sugar solution by ICUMSA method.
- (vii) Preparation and standardization of solutions of different concentration.

**Biochemistry Division**

- (i) Determination of RS and TRS in Molasses.
- (ii) Determination of BOD and COD in effluent.
- (iii) DO in feed water, boiler water, blow down water and various condensate.

**Agriculture chemistry Division**

- (i) TSS, (ii) TDS, (iii) Hardness, (iv)Silica content,
- (v) Phosphate in feed water, boiler water, blow down water and various condensate.

