St. Xavier's College (Autonomous), Kolkata

Established in 1860

Autonomous College (2006), College with Potential for Excellence (2006)
College of Excellence (2014), College with a Special Heritage Status (2015)
A++ College with 3.77 CGPA (2017)

M. Sc. in MICROBIOLOGY

Admission Notice 2019 - 2020

ELIGIBILITY CRITERIA

- Candidates who have cleared the B.Sc Major (Honours) in Microbiology or any other subject of Life sciences with a minimum of 55% marks in Honours (45% for reserved category).

- Candidates who have completed 2nd year or 5th Semester in 2018 and are awaiting final year / 6th semester Examination Results are also eligible to apply. Admission for such candidates will be provisional and be conditional to their passing the qualifying examination with the minimum required marks [55% for General and 45% for Reserved category].

- No candidate shall be eligible for admission after a lapse of more than five years from the year of passing the previous qualifying examination. The year of admission will not be taken into account while calculating five years from the year of passing the previous qualifying examination.

APPLICATION & ADMISSION PROCEDURE

Online Application Forms	10th April to 17th May 2019
Admission Test	25th May 2019 from 2pm to 4pm. (revised)

All dates are tentative and subject to change. Any change in dates will be informed though the College Website only.

FORMAT OF ADMISSION TEST:

Total 100 marks **Time-2 hrs**

1. **Multiple Choice Questions**---25x2=**50 marks**
2. **Short answer questions**—10 questions to be answered from 12 questions (each question 5 marks)—10x5=**50 marks**

Major domains/areas of microbiology: (equal weightage on all topics)

Syllabus

- **Introductory Microbiology (including bacteriology)**

✓ Notable Contributions in the Development of Microbiology
✓ Position of Microbes in the Living World
✓ Microscopy and Stains and Staining Techniques
✓ Microbial Nutrition
✓ Bacterial Growth
✓ Bacterial Morphology

- ✓ Control of Microbes
- ✓ Eukaryotic Microbes-Algae, fungi, Protozoa
- **Virology**

General Characteristics and Structural Components of virus , Experimental evidence, Example of plant virus and bacteriophage, Lytic cycle of T odd and even bacteriophages and Lysogenic cycle of lambda phage, Animal virus, Oncogenic Virus. Prions, viroids, virusois.

- **Immunology--**Types of immunization, Types of immunity, Immunoglobulin Structure and Function, Antigen Antibody Interaction-Aggutination, precipitation, Neutralization etc. Antigen Structure, Immune elements, Clonal selection theory, Complement Fixation, Hypersensitivity, Monoclonal antibodies, Vaccine and Vaccination.
- **Agricultural Microbiology-** Plant pathology, Biogeochemical Cycles, Heavy metal and metallic toxicity
- **Environmental Microbiology**
  - ✓ Air Microbiology
  - ✓ Soil Microbiology
  - ✓ Water Microbiology
- **Food Microbiology**
  - ✓ Microbial Flora of fresh food (Meats, Poultry, Eggs, Fruits and Vegetables, Shellfish and Finfish) and Milk.
  - ✓ Microbial Spoilage of food – Fresh food, Fresh milk, Canned food and Stored Grains.
  - ✓ Preservation of Food – Heat treatment, Pasturization, Appertization, Aseptic Packaging. Low temperature Processing (Chilling and Freezing), Dehydration, Chemical Preservatives (Organic acids, esters and sulphur dioxide), High osmotic Pressure, Antibiotics and Radiation
  - ✓ Fermented food – Fermented Dairy product (Cheese, Yogurt, kefir, kumiss etc.) and other fermented food (sauerkraut, pickles, green olives and sausages, tea etc.) (h) Food borne disease – Salmonellosis, Botulism and E.coli poisoning, aflatoxin and other toxins
- **Industrial Microbiology**
  - ✓ Microbial Fermentation
  - ✓ Industrial Production of Ethyl alcohol using most common and low cost raw materials. Alcoholic beverages (fermented beverages e,g, wine & beer; distilled spirits e.g. whiskey) Preservation of industrial cultures
- **Biochemistry and Biophysical Instrumentation**

✓ Stereochemistry, Principles and applications of thermodynamics and Kinetics
✓ Physico-Chemical Properties of water
✓ Analytical techniques in biochemistry and biophysics viz. TLC, HPLC, Ion exchange and gel exclusion chromatography and gel electrophoresis
✓ Carbohydrates
✓ Nucleic acids and chromosome structure and function
✓ Amino acids and Proteins
✓ Enzymes
✓ Lipid, amino acid and Protein, Carbohydrate metabolism
✓ Bioenergetics

- **Molecular Biology and genetics**
  - ✓ Recombinant DNA Technology
  - ✓ Microbial Genetics – Bacterial Recombination
  - ✓ Prokaryotic and eukaryotic replication, transcription and translation
- **Medical Microbiology**
  - ✓ Normal microbial flora of human body
  - ✓ Mechanism of Bacterial Pathogenicity
  - ✓ Common Microbial diseases
- **Cell Biology—**structure and function of cell membrane, transport across membrane, cell cycle and cell division, double and single membrane organelles.