

**PLACEMENT EXAM TO QUALIFY FOR EXEMPTION FROM CHEM 2110  
MAY 2021**

Date: May 25<sup>th</sup>, 3:30 – 5:30 PM

Exam to be held online. Students interested in taking the exam must send an e-mail to the Department of Chemistry no later than December 1. The e-mail must include the following information:

NAME (at it appears in CUNYFirst):

E-mail address:

EMPLID:

Please send this information to Ms. Virginia Tolone-Wilson [VTWilson@brooklyn.cuny.edu](mailto:VTWilson@brooklyn.cuny.edu) and Ms. Margarita Rice [Margarita.Rice@brooklyn.cuny.edu](mailto:Margarita.Rice@brooklyn.cuny.edu) by **May 10, 2021**.

A detailed description of topics to be covered is given on the following page.

**Preparing for the Exam:**

Book: (General Chemistry II Textbook Used in BC)

-*Chemistry 2e* (free e-book, <https://openstax.org/details/books/chemistry-2e>) by P. Flowers, K. Theopold, R. Langley and W. R. Robinson.

Students will also need to make use of an organic chemistry textbook to address some of the topics listed below.

-*Organic Chemistry, 8<sup>th</sup> Edition* by W. Brown, C.S. Foote, B.L. Iverson, E. Anslyn, Cengage, 2018.

Topics to be Covered in the Exam:

**1) “Atomic and Bonding Theories”**

- Atomic structure
- Electronic distribution of atoms.
- Periodic variations in element properties: Atomic Radius, Electronegativity, Polarizability.
- Lewis Model of Bonding: Ionic and Covalent Bonds, Lewis Symbols and Structures.
- Lewis Model of Bonding: Formal Charges, Octet Rule. .
- Valence-shell electron-pair repulsion theory and molecular geometry
- Valence Bond Theory (Hybridization)
- Molecular Orbital Theory of Homonuclear Diatomic Orbitals
- Basic Principles of Resonance Theory

**2) “Organic Chemistry”**

- Hydrocarbons, including nomenclature of simple compounds
- Conformations of alkanes and cycloalkanes
- Structures of common functional groups
- Chirality and optical isomerism

**3) “Organic Chemistry Reactions Elementary Steps”**

- Bond formation and bond breaking
- Reaction Mechanisms, Free energy diagrams, transition states, reaction coordinates
- Curve arrow notation in simple acid/base reactions.