# 都立国際高校　年間授業計画／Tokyo Metropolitan Kokusai High School　Course Syllabus

## ○ 科目基礎情報 ( Course information )

| | | | | |
|---|---|---|---|---|
| 開講年度 | ( | Academic year | ) | 令和5年度 ( 2023 年度 ) |
| 開講学科 | ( | Department | ) | 国際学科国際バカロレアコース／IBDP(International Baccalaureate Diploma Programme) |
| 教科 | ( | Subject Area | ) | Science |
| 科目 | ( | Subject | ) | Basic Chemistry |
| 学年･クラス | ( | Grade･Class | ) | 1st Grade Class A~F |
| 単位数 | ( | Number of units | ) | 2 |
| 使用教科書 | ( | Text Books | ) | 化学基礎(東京書籍) |
| 校外学習 | ( | Field trip | ) | None |

## ○ 教科の目標 ( Goals of the subject area )

【知　識　及　び　技　能】( Knowledge and Skills )
Acquire a body of knowledge, methods and techniques that characterize science and technology.
Develop an understanding of the relationships between scientifc disciplines and their influence on other areas of knowledge.
【思考力、判断力、表現力等】 ( Ability to think, make judgements, express themselves )
Apply and use the a body of knowledge, methods and techniques that characterize science and technology .
Develop an ability to analyze, evaluate and synthesize sciencitific information.
Develop experimental and investigate scientific skills including the use of current technologies.
【学びに向かう力、人間性等】 ( Motivation to learn, Humanity )
Appreciate scientific study and creativity within a global context through stimulating and challenging opportunities.
Develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities.

## ○ 科目の目標 ( Goals of the subject )

| 【知識及び技能】<br>( Knowledge and Skills ) | 【思考力、判断力、表現力等】<br>( Ability to think, make judgements, express themselves ) | 【学びに向かう力、人間性等】<br>( Motivation to learn, Humanity ) |
|---|---|---|
| Demonstrate knowledge and understanding of:<br>a. Facts, concepts and terminology<br>b. Methodologies and techniques<br>c. Communicating scientific information | Apply<br>a. Facts, concepts and terminology<br>b. Methodologies and techniques<br>c. Methods and communicating scientific information | Demonstrate the appropriate research, experimental,<br>and personal skills necessary to carry out insightful<br>and ethical investigations. |

## ○ 授業計画 ( Course schedule )

| | 単元の具体的な指導目標<br>Unit Objectives | 指導項目・内容<br>Topic / Contents | 領域<br>話・聞 | 書 | 読 | 評価規準<br>Evaluation Criteria | 知<br>❶ | 思<br>❷ | 態<br>❸ | Alotted hours<br>配当時数 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1学期 ( 1st semester) | 単元名を記載<br>【知識及び技能】<br><br>【思考力、判断力、表現力等】<br><br>【学びに向かう力、人間性等】 | ・指導事項<br>・教材<br>・一人１台端末の活用　等 | ○ | | | ❶【知識・技能】<br><br>❷【思考・判断・表現】<br><br>❸【主体的に学習に取り組む態度】 | ○ | ○ | ○ | 6 |
| | Unit 1: Stochiometry -Particulate Theory of Matter<br>【Knowledge and Skills】<br>Develop understanding on the concept of matter<br><br>【Ability to think, make judgements, express themselves】<br>Be able to explain the processes invloved in the transition of matter.<br>Be able to interpret the cooling and heating curve of various substances using data and conduction od experiments.<br>【Motivation to learn, Humanity】<br>Enggages actively in the practicals<br>Work collaboratively with other classmates during practicals | ･Contents<br>Matter<br>Kinetic/ Particulate Theory<br>Cooling and Heating Curve<br>Separating Techniques<br>･Teaching materials<br>Textbook, Powerpoint slides | ○ | | | ❶【Knowledge/Skills】<br>Short Test, Examination, Lab Report, Home Work<br><br>❷【Ability to think/make judgements/express themselves】<br>Examination, Presentation, Class Discussions<br>❸【Attitude towards learning proactively】<br>Reflection | ○ | ○ | ○ | 4 |
| | 定期考査<br>Examination | | | | | | ○ | ○ | | 1 |

| | 単元の具体的な指導目標<br>Unit Objectives | 指導項目・内容<br>Topic / Contents | 領域<br>話・聞 | 書 | 読 | 評価規準<br>Evaluation Criteria | 知<br>❶ | 思<br>❷ | 態<br>❸ | 配当時数 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1学期 ( 1st semester) | Unit 2: Atomic Structure<br>【Knowledge and Skills】<br>Develop understanding of the atomic structure<br>Develop understanding of the origination of the subatomic particles<br>Be able to differentiate amongst the subatomic particles<br>【Ability to think, make judgements, express themselves】<br>Be able to calculate the mass, proton, neutron and electron numbers.<br>Be able to predict the electronic configuartion of elements.<br><br>【Motivation to learn, Humanity】】<br>Engages actively in the practicals<br>Work collaboratively witih other classmates during practicals. | ・Contents<br>Atomic structure<br>Discovery of the sub-atomic particles<br>Determination of the proton, electron, neutron numbers and the mass number<br>Electronic configuration<br>・Teaching materials<br>Textbook, Powerpoint slides | | ○ | | ❶【Knowledge/Skills】<br>Short Test, Examination, Lab Report, Home Work<br><br>❷【Ability to think/make judgements/express themselves】<br>Examination, Presentation, Class Discussions<br>❸【Attitude towards learning proactively】<br>Reflection | ○ | ○ | ○ | 6 |
| | Unit 3: Periodicity<br>【Knowledge and Skills】<br>Develop understanding of the trends of the periodic table<br>Develop understanding of the origination of the subatomic particles<br>Be able to differentiate amongst the subatomic particles<br>【Ability to think, make judgements, express themselves】<br>Be able to predict the trends of various elements.<br>【Motivation to learn, Humanity】】<br>Engages actively in the practicals<br>Work collaboratively witih other classmates during practicals. | ・Contents<br>Orignation of the Periodic Table<br>The Periodic Table<br>Periodic Trends (Groups and Periods)<br>・Teaching materials<br>Textbook, Powerpoint presentation<br>・Effective use of students' PC etc. | | ○ | | ❶【Knowledge/Skills】<br>Short Test, Examination, Lab Report, Home Work<br><br>❷【Ability to think/make judgements/express themselves】<br>Examination, Presentation, Class Discussions<br>❸【Attitude towards learning proactively】<br>Reflection | ○ | ○ | ○ | 5 |
| | 定期考査<br>Examination | | | | | | ○ | ○ | | 1 |
| 2学期 ( 2nd semester) | Unit 4: Chemical Bonding<br>【Knowledge and Skills】<br>Develop understanding on isotopes<br>Develop the understanding of Chemical Bonding<br>【Ability to think, make judgements, express themselves】<br>Be able to represent the Lewis structures of compunds.<br>Be able to represent the different types of bonding given the names of chemical compounds.<br>【Motivation to learn, Humanity】<br>Engages activiely in the practicals<br>Work collaboratively with other classmates during practicals | ・Contents<br>Isotopes and radioisotopes<br>Chemical bonding- ionic, covalent, metallic and coordinate (Dative Bonding).<br>Lewis diagrams of chemical bonding.<br>Chemical bonding structures<br>Allotropes: Diamond, Graphite<br>・Teaching materials<br>Textbook, Powerpoint presentation<br>・Effective use of students' PC etc. | | | | ❶【Knowledge/Skills】<br>Short Test, Examination, Lab Report, Home Work<br><br>❷【Ability to think/make judgements/express themselves】<br>Examination, Presentation, Class Discussions<br>❸【Attitude towards learning proactively】<br>Reflection | ○ | ○ | ○ | 16 |
| | 定期考査<br>Examination | | | | | | ○ | ○ | | 1 |

| | 単元の具体的な指導目標<br>Unit Objectives | 指導項目・内容<br>Topic / Contents | 領域<br>話・聞 | 書 | 読 | 評価規準<br>Evaluation Criteria | 知<br>❶ | 思<br>❷ | 態<br>❸ | 配当時数 |
|---|---|---|---|---|---|---|---|---|---|---|
| 2学期 ( 2nd semester) | Unit 5: Stochiometry - Mole Concept<br>【Knowledge and Skills】<br>Develop understanding of the mole concept.<br>Develop understanding in the relationship of moles, mass, mass concentration, molar concentration and volume.<br>Develop understanding of Avagadros Law and how to apply the law.<br>【Ability to think, make judgements, express themselves】<br>Be able to calculate questions related to the mole concept.<br>Be able to interpret experimental data to calculate moles, mass, volumes, molar concentration, mass concentration, percent mass of hydrate, empirical and molecular formula<br>【Motivation to learn, Humanity】<br>Enggages activiely in the practicals<br>Work collaboratively with other classmates during practicals | ・Contents<br>The mole concept<br>Avogadros constant and Law<br>Moles, Mass, Mass Concentration and Molar concentration<br>Percentage Mass of Hydrate<br>Empirial and Molecular formula<br>・Teaching materials<br>Textbook, Powerpoint presentation | | | | ❶【Knowledge/Skills】<br>Short Test, Examination, Lab Report, Home Work<br><br>❷【Ability to think/make judgements/express themselves】<br>Examination, Presentation, Class Discussions<br>❸【Attitude towards learning proactively】<br>Reflection | ○ | ○ | ○ | 16 |
| | 定期考査<br>Examination | | | | | | ○ | ○ | | 1 |
| 3学期 ( 3rd semester) | Unit 6: Acids and Bases<br>【Knowledge and Skills】<br>Develop understanding on pH, Acids, Bases and indicators<br>【Ability to think, make judgements, express themselves】<br>Be able to make calculations related to pH<br>Be able to predict the acidity, Bascity of various substances<br>Be able to recall the use of indicators and the appropriaate indicators to use in chemical experiments.<br>【Motivation to learn, Humanity】<br>Engages activiely in the practicals<br>Work collaboratively with other classmates during practicals | ・Contents<br>Definition of terms related to pH (Arrhenius Acids and Bases)<br>Relation of Acidity, Bascity and Neutrality to the pH scale<br>Indicators, its use and selection.<br>Calculations related to pH<br>・Teaching materials<br>Textbook, Powerpoint presentation | | | | ❶【Knowledge/Skills】<br>Short Test, Examination, Lab Report, Home Work<br><br>❷【Ability to think/make judgements/express themselves】<br>Examination, Presentation, Class Discussions<br>❸【Attitude towards learning proactively】<br>Reflection | ○ | ○ | ○ | 12 |
| | Unit 7: Redox Properties<br>【Knowledge and Skills】<br>Develop understanding of electrochemical reactions<br>Develop understanding of Quantity of Electricity and Faraday's constant, F.<br>【Ability to think, make judgements, express themselves】<br>Be able to interpret electrolytic cells and predict ions that will be preferentially dischagred at the electrodes.<br>【Motivation to learn, Humanity】<br>Engages activiely in the practicals<br>Work collaboratively with other classmates during practicals | ・Contents<br>Definition of electrochemical terms<br>Electrolytic cell diagram<br>The electrodes and rules for ions to be preferentially discharged.<br>Quantity of Electricity<br>Faraday's constant and relation to moles.<br>・Teaching materials<br>Textbook, Powerpoint presentation | | | | ❶【Knowledge/Skills】<br>Short Test, Examination, Lab Report, Home Work<br><br>❷【Ability to think/make judgements/express themselves】<br>Examination, Presentation, Class Discussions<br>❸【Attitude towards learning proactively】<br>Reflection | ○ | ○ | ○ | 8 |
| | 定期考査<br>Examination | | | | | | ○ | ○ | | 1 |

| 総授業時数<br>Total hours | 78 |
|---|---|