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4年度 (2022 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	)	Sciece
科目	(	Subject	)	Basic Physics
担当者	(	Subject Teacher	)	
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	)	高等学校　考える物理基礎(啓林館)
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 scientific 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 a body of knowledge, methods and techniques that characterize science and technology
- ･develop an ability to analyse, evaluate and synthesize scientific information
- ･develop experimental and investigative 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】 (Knowledge and Skills)	【思考力、判断力、表現力等】 (Ability to think, make judgements, express themselves)	【学びに向かう力、人間性等】 (Motivation to learn, Humanity)
Demonstrate knowledge and understanding of: a. facts, concepts and terminology b. methodologies and techniques c. communicating scientific information	Apply: a. facts, concepts and terminology b. methodologies and techniques c. methods of communicating scientific information.	Demonstrate the appropriate research, experimental, and personal skills necessary to carry out insightful and ethical investigations.

○ 授業計画 (Course schedule)

	単元の具体的な指導目標 Unit Objectives	指導項目・内容 Topic / Contents	評価規準 Evaluation Criteria	知 ❶	思 ❷	態 ❸	Alotted hours 配当時数
1学期 (1st semester)	Mechanics (Equations of motion) 【Knowledge and Skills】 ･Develop understanding of equations of motion 【Ability to think, make judgements, express themselves】 ･Be able to use equations of motion to solve problems ･Be able to apply equations of motion to carry out practical investigation 【Motivation to learn, Humanity】 ･Engages actively in the practicals ･Work collaboratively with other classmates during practicals	Contents: ・Displacement, velocity and acceleration ・Equations of motion Teaching materials: ・Textbook, PowerPoint slides	❶【Knowledge/Skills】 ･Short test, Examination, Lab report ❷【Ability to think/make judgements/express themselves】 ･Examination, Poster presentation ❸【Attitude towards learning proactively】 ･Reflection	○	○	○	10
	定期考査 Examination			○	○		1
	Mechanics (Force / Work) 【Knowledge and Skills】 ･Develop understanding of force and energy ･Be able to explain the motion from the perepctive of both force and energy 【Ability to think, make judgements, express themselves】 ･Be able to use Newton's equations of motion to solve problems 【Motivation to learn, Humanity】 ･Engages actively with other classmates during practicals	Contents: ・Newton's three laws of motion, work and energy Teaching materials: ・Textbook, PowerPoint slides	❶【Knowledge/Skills】 ･Short test, Examination, Lab report ❷【Ability to think/make judgements/express themselves】 ･Examination, Poster presentation ❸【Attitude towards learning proactively】 ･Reflection	○	○	○	10
	定期考査 Examination			○	○		1

	単元の具体的な指導目標 Unit Objectives	指導項目・内容 Topic / Contents	評価規準 Evaluation Criteria	知 ❶	思 ❷	態 ❸	配当時数
2学期（2nd semester）	Thermophysics (Heat transfer) 【Knowledge and Skills】 ・Develop understanding of heat and how it flows ・Develop understanding of heat transfer and thermal equilibrium 【Ability to think, make judgements, express themselves】 ・Be able to use Q=mcΔT to solve problems 【Motivation to learn, Humanity】 ・Engages actively in the practicals ・Work collaboratively with other classmates during practicals	Contents: ・Heat, temperature, Q=mcΔT, types of heat transfer Teaching materials: ・Textbook, PowerPoint slides	❶【Knowledge/Skills】 ・Short test, Examination, Lab report ❷【Ability to think/make judgements/express themselves】 ・Examination, Poster presentation ❸【Attitude towards learning proactively】 ・Reflection	○	○	○	9
	Thermophysics (Thermodynamics) 【Knowledge and Skills】 ・ Develop understanding of the motion of a piston ・ Develop understanding of entropy 【Ability to think, make judgements, express themselves】 ・ Be able to analyze PV-graph of a piston cycle 【Motivation to learn, Humanity】 ・ Engages actively in the practicals ・ Work collaboratively with other classmates during practicals.	Contents: ・ Different kinds of engine cycle, 1st and 2nd law of thermodynamics, Carnot cycle Teaching materials: ・ Textbook, PowerPoint slides	❶【Knowledge/Skills】 ・Short test, Examination, Lab report ❷【Ability to think/make judgements/express themselves】 ・Examination, Poster presentation ❸【Attitude towards learning proactively】 ・Reflection	○	○	○	8
	定期考査 Examination			○	○		1
	Wave (Travelling wave) 【Knowledge and Skills】 ・Develop understanding of waves and their properties ・Develop understanding of displacement-time, displacement-distance graph 【Ability to think, make judgements, express themselves】 ・Be able to use wave equation to solve problems 【Motivation to learn, Humanity】 ・Engages actively in the practicals ・Work collaboratively with other classmates during practicals	Contents: ・ Terminologies, longitudinal and transverse wave, displacement-distace graph and displacement-time graph, wave equation, reflection of waves, superposition of waves Teaching materials: ・ Textbook, PowerPoint slides	❶【Knowledge/Skills】 ・Short test, Examination, Lab report ❷【Ability to think/make judgements/express themselves】 ・Examination, Poster presentation ❸【Attitude towards learning proactively】 ・Reflection	○	○	○	8
	Wave (Standing wave) 【Knowledge and Skills】 ・Develop understanding of standing wave in musical instruments 【Ability to think, make judgements, express themselves】 ・Be able to calculate frequencies of sound at different harmonics for open/closed end pipes 【Motivation to learn, Humanity】 ・Engages actively in the practicals ・Work collaboratively with other classmates during practicals	Contents: ・ Standing wave, characteristics of sound, beat, harmonics in open-end and closed-end pipes Teaching materials: ・ Textbook, PowerPoint slides	❶【Knowledge/Skills】 ・Short test, Examination, Lab report ❷【Ability to think/make judgements/express themselves】 ・Examination, Poster presentation ❸【Attitude towards learning proactively】 ・Reflection	○	○	○	8
	定期考査 Examination			○	○		1
3学期（3rd semester）	Electricity and magnetism (Electricity) 【Knowledge and Skills】 ・Develop understanding of static electricity ・Develop understanding of electric circuits and ohm's law 【Ability to think, make judgements, express themselves】 ・Be able to calculate voltage, current or resistance for a given electric circuits 【Motivation to learn, Humanity】 ・Engages actively in the practicals ・Work collaboratively with other classmates during practicals	Contents: ・ Charges, Ohm's Law, parallel and series circuits, Joule heating effect, direct and alternting current Teaching materials: ・ Textbook, PowerPoint slides	❶【Knowledge/Skills】 ・Short test, Examination, Lab report ❷【Ability to think/make judgements/express themselves】 ・Examination, Poster presentation ❸【Attitude towards learning proactively】 ・Reflection	○	○	○	12
	Electricity and magnetism (Magnetism) 【Knowledge and Skills】 ・Develop understanding of magnetic field around a solid magnet ・Develop understanding of magnetic field around current 【Ability to think, make judgements, express themselves】 ・Be able touse right-hand grip rule and left-hand Fleming's rule to determine the direction of ginduced magnetic field 【Motivation to learn, Humanity】 ・Engages actively in the practicals ・Work collaboratively with other classmates during practicals	Contents: ・ Magnetic field around a solid magnet and induced by electric current, electromagnetic induction, Lenz's law, transformer Teaching materials: ・ Textbook, PowerPoint slides	❶【Knowledge/Skills】 ・Short test, Examination, Lab report ❷【Ability to think/make judgements/express themselves】 ・Examination, Poster presentation ❸【Attitude towards learning proactively】 ・Reflection	○	○	○	8
	定期考査 Examination			○	○		1

総授業時数 Total hours	78