

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	Science
科目 / Course Title	DP Physics Higher Level (HL)
学年・クラス / Year・Class	2 (IBDP 1st year)
単位数 / credits	6

科目概要情報 / Course description

講座概要 / Course description	Physics is the most fundamental of the experimental sciences as it seeks to explain the universe itself, from the very smallest particles to the vast distances between galaxies. Despite the exciting and extraordinary development of ideas throughout the history of physics, observations remain essential to the very core of the subject. Models are developed to try to understand observations, and these themselves can become theories that attempt to explain the observations. By studying physics students should become aware of how scientists work and communicate with each other. While the scientific method may take on a wide variety of forms, it is the emphasis on a practical approach through experimental work that characterizes the subject. Teachers provide students with opportunities to develop manipulative skills, design investigations, collect data, analyse results and evaluate and communicate their findings.
到達目標 / Course objectives	Through the overarching theme of the nature of science, the aims of the DP physics course are to enable students to: <ul style="list-style-type: none"> * appreciate scientific study and creativity within a global context through stimulating and challenging opportunities * acquire a body of knowledge, methods and techniques that characterize science and technology * 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 a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities * develop experimental and investigative scientific skills including the use of current technologies * become critically aware, as global citizens, of the ethical implications of using science and technology
評価方法と評価基準 / Evaluation method and criteria	Students will be evaluated as follows: Paper 1: 40 multiple-choice questions, duration 1 hour, weighing 20%, marks 40 Paper 2: Short-answer and extended-response questions on core and AHL, duration 2 hours and 15 minutes, weighing 36%, marks 95 Paper 3: Questions on core and HL option material, duration 1 hour and 15 minutes, weighing 20%, marks 24 Internal assessment: Duration 10 hours, weighing 20%, 24 marks
教科書 / Textbooks	Physics (2014 Edition) by David Homer and Michael Bowen-Jones
校外学習 / Field trip	

授業計画 / Course schedule

	指導項目 / Topic	指導内容 / Contents	評価の方法・基準 / Evaluation method and criteria	予定時数 / Allotted hours
1学期 / 1st semester	4月 Measurements and uncertainties	•Measurements in physics •Uncertainties and errors •Vectors and scalars	Paper 3 type data-based questions, practical work	20
	5月 Mechanics	•Motion •Forces •Work, energy and power •Momentum and Impulse	Paper 1 and Paper 2 types of questions, practical work	30
	6月 Thermal Physics	•Thermal concept •Modelling a gas	Paper 1 and Paper 2 types of questions, practical work	30
	7月 Waves	•Oscillations •Travelling waves •Wave characteristic •Wave behavior •Standing waves	Paper 1 and Paper 2 types of questions, practical work	20
2学期 / 2nd semester	9月 Electricity and Magnetism	•Electric fields •Heating effects of currents •Electric cells •Magnetic effects of electric currents	Paper 1 and Paper 2 types of questions, practical work	22
	10月 Circular motion and gravitation	•Circular motion •Newton's law of gravitation	Paper 1 and Paper 2 types of questions, practical work	30
	11月 Atomic, nuclear and particle physics	•Discrete energy and radioactivity •Nuclear reactions •The structure of matter	Paper 1 and Paper 2 types of questions, practical work	24
	12月 Energy production	•Energy sources •Thermal energy transfer	Paper 1 and Paper 2 types of questions, practical work	10
3学期 / 3rd semester	1月 Wave phenomena	•Simple harmonic motion •Single-slit diffraction •Interference •Resolution •Doppler effect	Paper 1 and Paper 2 types of questions, practical work	16
	2月 Fields and Electromagnetic induction	•Describing force fields •Fields at work •Electromagnetic induction •Power generation and transmission Wave behavior •Capacitance	Paper 1 and Paper 2 types of questions, practical work	22
	3月 Quantum and nuclear physics	•Interaction of matter with radiation •Nuclear physics	Paper 1, Paper 2 and Paper 3 types of questions, practical work	10