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6年度 (2024 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)	Mathematics
科目	(Subject)	Mathematics: analysis and approaches　Standard Level
学年･クラス	(Grade･Class)	DP2
単位数	(Number of units)	4
使用教科書	(Text Books)	Peason Mathematics Analysis and Approaces for the IB Diploma
校外学習	(Field trip)	-

○ 教科の目標 (Goals of the subject area)

【知　識　及　び　技　能】 (Knowledge and Skills)
Understand the basic concepts, principles and laws in mathematics, as well as the skills to mathematically interpret and express events.

【思考力、判断力、表現力等】 (Ability to think, make judgements, express themselves)
Develop the ability to examine events logically using mathematics, to recognize the essence of events and their relationships with other events and to examine them in an integrated and developed manner, and to express events concisely, clearly, and precisely using mathematical expressions.

【学びに向かう力、人間性等】 (Motivation to learn, Humanity)
Develop an attitude to recognize the advantages of mathematics and actively utilize mathematics, an attitude to think tenaciously and make judgments based on mathematical arguments, an attitude to reflect on the process of problem solving and to deepen consideration, evaluation and improvement, and a basis for creativity.

○ 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)
Understand the basic concepts, principles and laws in mathematics, as well as the skills to mathematically interpret and express events.	Develop the ability to examine events logically using mathematics, to recognize the essence of events and their relationships with other events and to examine them in an integrated and developed manner, and to express events concisely, clearly, and precisely using mathematical expressions.	Develop an attitude to recognize the advantages of mathematics and to make use of mathematics, an attitude to think tenaciously and to make judgments based on mathematical arguments, and an attitude to deepen consideration, evaluation, and improvement by looking back on the process of problem solving, as well as a basis for creativity.

○ 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)	Students will be able to ･apply the binomial theorem ･use the formulae for the nth term and the sum of the first n terms of an arithmetic/geometric sequence ･apply arithmetic sequences and series to model situations ･apply geometric sequences and series to financial applications ･work with infinite, convergent geometric sequences and series ･work with exponents and logarithms ･change the base of a logarithm ･solve equations using logarithms ･find arc length and area of a sector ･solve trigonometric equations in a finite interval ･prove trigonometric identities ･model practical situations with trigonometric equations ･sketch any given function using a calculator in degree or radian mode.	･The Binomial Seorem ･Number Sequences ･Exponential Functions ･Logarithms ･The Unit Circle and Radian Measure ･Trigonometric Functions ･Trigonometric Eqauations and Identities	❶【Knowledge/Skills】 ･Recall, select and use their knowledge of mathematical facts, concepts and techniques in a variety of familiar and unfamiliar contexts. ･Use technology accurately, appropriately and efficiently both to explore new ideas and to solve problems. ❷【Ability to think/make judgements/express themselves】 ･Recall, select and use their knowledge of mathematical skills, results and models in both abstract and real-world contexts to solve problems. ･Transform common realistic contexts into mathematics; comment on the context; sketch or draw mathematical diagrams, graphs or constructions both on paper and using technology; record methods, solutions and conclusions using standardized notation; use appropriate notation and teminology. ･Construct mathematical arguments through use of precise statements, logical deduction and interference and by the manipulation of mathematical expressions. ･Investigate unfamiliar situations, both abstract and from the real world, involving organizing and analyzing information, making conjectures, drawing conclusions, and testing their validity. ❸【Attitude towards learning proactively】 ･Be interested in mathematics, recognize the advantages of mathematics, and try to apply them to both abstract and real-world contexts to solve problems.	○	○	○	54
	定期考査 Examination			○	○		2

	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）	Stundets will be able to ・differentiate composite expressions of basic functions ・find and classify stationary points ・decide where a graph is increasing/decreasing ・find and classify points of inflexion ・find tangents and normals ・solve opitimization problems ・find indefinite and definite integrals ・find areas under curves ・find areas between curves ・find displacement, velocity and acceleration using differentiation and integration.	・Introduction to Differential Calculus ・Rules of Differentiation ・Properties of Curves ・Applications of Differentiation ・Introduction to Integration ・Techniques for Integration ・Definite Integrals ・Kinematics	❶【Knowledge/Skills】 ・Recall, select and use their knowledge of mathematical facts, concepts and techniques in a variety of familiar and unfamiliar contexts. ・Use technology accurately, appropriately and efficiently both to explore new ideas and to solve problems. ❷【Ability to think/make judgements/express themselves】 ・Recall, select and use their knowledge of mathematical skills, results and models in both abstract and real-world contexts to solve problems. ・Transform common realistic contexts into mathematics; comment on the context; sketch or draw mathematical diagrams, graphs or constructions both on paper and using technology; record methods, solutions and conclusions using standardized notation; use appropriate notation and teminology. ・Construct mathematical arguments through use of precise statements, logical deduction and interference and by the manipulation of mathematical expressions. ・Investigate unfamiliar situations, both abstract and from the real world, involving organizing and analyzing information, making conjectures, drawing conclusions, and testing their validity. ❸【Attitude towards learning proactively】 ・Be interested in mathematics, recognize the advantages of mathematics, and try to apply them to both abstract and real-world contexts to solve problems.	○	○	○	52
		・Internal Assesment (IA)		○	○	○	6
	定期考査 Examination			○	○		2
3学期（3rd semester）	Stundets will be able to ・calculate measures of central tendency ・calculate measures of dispersion ・draw box-and-whisker plots ・use comulative frequency graphs ・draw scatter diagrams ・calculate Pearson's product moment correlation coefficient ・calculate regression lines ・make predictions from a regression line ・find probabilities of combined events ・work with discrete probability distributions, including the binomial distribution ・work with continuous probability distributions, including the normal distribution ・find conditional probabilities.	・Bivariate Statistics ・Discrete Random Variables ・The Normal Distribution	❶【Knowledge/Skills】 ・Recall, select and use their knowledge of mathematical facts, concepts and techniques in a variety of familiar and unfamiliar contexts. ・Use technology accurately, appropriately and efficiently both to explore new ideas and to solve problems. ❷【Ability to think/make judgements/express themselves】 ・Recall, select and use their knowledge of mathematical skills, results and models in both abstract and real-world contexts to solve problems. ・Transform common realistic contexts into mathematics; comment on the context; sketch or draw mathematical diagrams, graphs or constructions both on paper and using technology; record methods, solutions and conclusions using standardized notation; use appropriate notation and teminology. ・Construct mathematical arguments through use of precise statements, logical deduction and interference and by the manipulation of mathematical expressions. ・Investigate unfamiliar situations, both abstract and from the real world, involving organizing and analyzing information, making conjectures, drawing conclusions, and testing their validity. ❸【Attitude towards learning proactively】 ・Be interested in mathematics, recognize the advantages of mathematics, and try to apply them to both abstract and real-world contexts to solve problems.	○	○	○	21
		・Internal Assesment (IA)		○	○	○	4
	定期考査 Examination			○	○		2

総授業時数 Total hours	152