○ 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　Higher Level	
学年・クラス	(Grade・Class)	DP2	
単位数	(Number of units)	6	
使用教科書	(Text Books)	Pearson Mathematics Analysis and Approaches for the IB Diploma Higher Level & Hodder Mathematics: Analysis and Approaches HL Exam Practice Workbook	
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	配当 時数 Alotted hours
1学期 (1st semester)	Students will be able to ・Review concepts that were part of the DP1 curriculum ・find numerical solutions of differential equations using Euler's method ・solve separable differential equations ・solve homogenous differential equations ・solve linear differential equations including the use of integrating factors ・Maclaurin series to obtain expansions for e^x, sin x, cos x, ln(1+x), and (1+x)^n, where n is a rational number. ・simple substitution, products, integration, and differentiation to obtain other series ・Maclaurin series developed from differential equations	・first-order differential equations ・Euler's method ・Separable and homogenous equations ・Integrating Factors ・Maclaurin series	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.	○	○	○	79
	MOCK Examination			○	○		5

	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 ・refamiliarized themselves with the contents of the IB mathematics: Analysis and Approaches syllabus.	・Review and practice for final exam	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.	○	○	○	91
	Final Examination			○	○		5
3学期（3rd semester）	Stundets will be able to ・refamiliarized themselves with the contents of the IB mathematics: Analysis and Approaches syllabus.	・Review	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.	○	○	○	48

総授業時数 Total hours	228