



International Baccalaureate®
Baccalauréat International
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IB Update

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3 options for 16-19 age students

The basic component of all our 16-18 programmes are the individual subject courses are called 'Diploma Courses' and are available at two levels: Higher and Standard



6 subjects + Extended Essay + Theory of Knowledge + CAS = 'Full' IB Diploma



1 + subjects = 'Diploma Courses'
May be offered with other quals, eg A Level or AP



2 + subjects + RP + language + PPS + CS + professional qual from another AB = 'IB Career-related Programme'

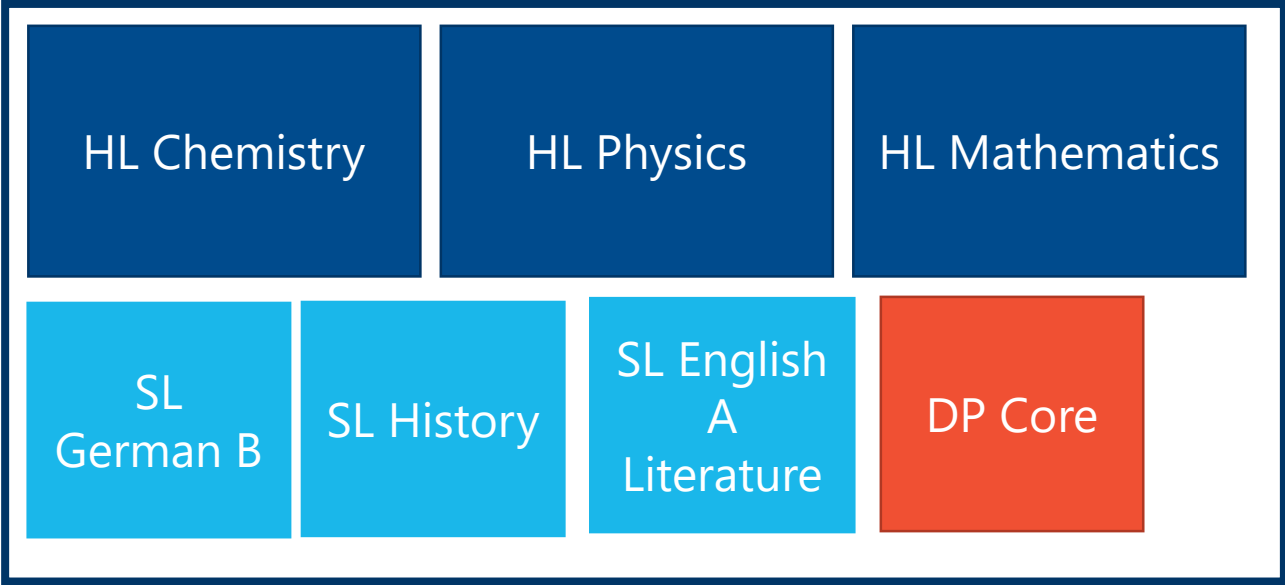
Combining Diploma Courses

HL Chemistry

HL Physics

SL English
A
Literature

**Diploma
Courses**



**The IB
Diploma is
5 A Level
equivalent
package**

Diploma Courses

- IB's position is if a student presents with Diploma Courses, rather than the full Diploma they should be treated the same as an A/AS Level applicant because this is the position taken by the DfE
- Students from the following backgrounds may present with Diploma Courses:
 - The IBCP – see later
 - A mixed economy school may not offer all options as both A Level and IB courses due to financial constraints, so forcing mixed quals
 - The student attends an IB only school but is unable to access one or more of the Diploma subjects
 - International applicants, particularly from a US orientated school
 - Students who have not passed the Diploma requirements, eg the student achieves an E in either TOK or EE. There are 12 failing conditions, but a student can attain 43 points and still fail the Diploma

2017 UCAS Tariff

- Current tariff has been disaggregated so that only the component parts are on the tariff
- Eg to achieve 34 total IB points there are 564 possible combinations. The 3 most common are:

HL	SL	EE/TOK	Tariff points
556	566	CC	192
556	556	BC	186
566	556	CC	200

- Has this been a problem?

Setting Entry Requirements

- The most common method is to require points total points and points at HL. Total points almost always include the Core.
- Manchester 32 points + 665 @ HL (where the HL points equate to the A Level offer) for most subjects
- Leeds 35 points + 17 @ HL
- Essex English 30 points + 5 @ HL humanities/English
- Plymouth Geography 28 points + 5 HL Geography
- A smaller number of HEI ask for UCAS tariff points, eg Christ Church Canterbury 88-112 tariff points
- Some evidence of 'or' offers, eg Kent, Anthropology 34 points or 16 @ HL, Exeter as well
- Some evidence of requiring just total points, eg Coventry (History & Politics) 27, Manchester Met (English) 26, Middlesex (Accounting) 28 points
- Some evidence of asking for just HL, eg RVC 766, English @ Nottingham Trent 14 points @ HL including 4 in English; BCU 14 points @ HL

CEFR alignment study

- Commissioned from UK NARIC; released November 2016: “Benchmarking Selected IB Diploma Programme Language Courses to the Common European Framework of Reference for Languages”
- Summary: <http://ibo.org/globalassets/publications/ib-research/dp/ib-dp-cefr-benchmarking-summary-en.pdf>
- Full report: <http://ibo.org/globalassets/publications/ib-research/dp/ib-dp-cefr-benchmarking-report-en.pdf>

Alignment of DP English courses with CEFR levels

CEFR Level	English B		English A: Language and Literature		English A: Literature		English Literature and Performance
	SL	HL	SL	HL	SL	HL	SL
C2							
C1		7	7	7	7	7	
B2+	7	6	6	6	6	6	
B2	6	5	5	5	5	5	5
B1	5	4		4	4	4	
A2	4	3					
A1	3	2					
A1	2						

Revised courses for 2017 & 2018 HE entry

First exam May 2017

- CAS – Creativity, Activity & Service
- Global Politics
- History
- Environmental Systems and Societies
- Nature of Science (pilot)

First Exam May 2018

- Sports Exercise & Health Science SL and HL
- Extended Essay

Further ahead

First teaching September 2018

- Language B – will include an assessed listening component

First teaching September 2019

- Mathematics – completely revised courses
- Language A (ie English)

DP Mathematics

Currently:

- Further mathematics HL, Mathematics HL, Mathematics SL, Mathematical studies SL

In development for first teaching 2019, first examination 2021:

Mathematics: Analysis and approaches HL and SL

Analytic methods with an emphasis on calculus – appropriate for pure mathematicians, engineers, scientists, economists, those with an interest in analytic methods – current calculus option content will form part of the HL course.

Mathematics: Applications and interpretation HL and SL

Applications and interpretation with an emphasis on statistics and use of technology – appropriate for social scientists, some economists, those with an interest in the applications of mathematics and how technology can support this – SL will be appropriate for students who would previously have taken Mathematical studies SL – current statistics and discrete option content will form part of the HL course.

Mathematics: analysis and approaches

Mathematics: applications and interpretation

5 key areas of Maths

- Number & Algebra
- Functions
- Geometry & Trigonometry
- Statistics and Probability
- Calculus

SL Common Core 60 hours

**Inquiry
Investigation
and
Modelling 30
hours**

**Inquiry
Investigation
and
Modelling 30
hours**

**A & A SL/HL
Common
Content 60
hours**

**A & I SL/HL
Common
Content 60
hours**

**A & A AHL
90 hours**

**A & I AHL
90 hours**

Time allocations

Syllabus component	Analysis Teaching hours		Applications Teaching hours	
	SL	HL	SL	HL
Topic 1 - Number and algebra	19	39	16	29
Topic 2 – Functions	21	32	31	42
Topic 3 - Geometry and trigonometry	25	51	18	46
Topic 4 - Statistics and probability	27	33	36	52
Topic 5 - Calculus	28	55	19	41
The “toolkit” and Mathematical exploration Investigative, problem-solving and modelling skills development leading to an individual exploration. The exploration is a piece of written work that involves investigating an area of mathematics.	30	30	30	30
Total teaching hours	150	240	150	240



Number and Algebra

Core

Operations with numbers in standard form

Arithmetic and geometric sequences and series

Applications of arithmetic and geometric sequences and series including compound interest and annual depreciation

Simplifying numerical expressions with integer exponents

Introduction to logarithms and natural logarithms

Analysis SL

Simple deductive proof

Laws of exponents with rational exponents

Laws of logarithms

Change of base of a logarithm

Solving exponential equations

Sum of infinite geometric sequences

The binomial theorem

Applications SL

Approximation, upper and lower bounds, percentage errors

Financial applications of geometric series: amortization and annuities

Solving systems of linear and polynomial equations

Analysis HL

Permutations and combinations

Binomial theorem with negative indices

Partial fractions

Complex numbers – Cartesian, modulus-argument and Euler form

Complex conjugate roots of quadratic and polynomial equations

De Moivre's theorem

Powers and roots of complex numbers

Proof by induction, contradiction and counter-example

Solving systems of linear equations

Applications HL

Laws of logarithms

Expressions with rational exponents

Sum of infinite geometric sequences

Complex numbers – Cartesian, modulus-argument and Euler form

Phase shift and voltage as complex quantities

Matrices: algebra and properties

Matrices applications to solving systems of equations, and coding and decoding messages

Eigenvalues and eigenvectors

Functions

Core

Different forms of equations of straight lines, including parallel and perpendicular lines

Functions and inverse functions

Graphing skills and determining key features of graphs including horizontal and vertical asymptotes

Finding the point of intersection of lines and curves using technology

Analysis SL

Composite, identity and inverse functions

The quadratic function – factorisation and completing the square

Solution of quadratic equations and inequalities

The quadratic formula and the nature of the roots

Reciprocal, rational (linear/linear), exponential and logarithmic functions

Equations of horizontal and vertical asymptotes

Solving equations graphically and analytically

Graph transformations, including composite transformations

Analysis HL

Polynomial functions, factor and remainder theorems

Viète's formula (sum and product of roots of polynomial equations)

Rational functions of the form linear/quadratic and quadratic/linear

Odd, even and self-inverse functions

Inverse functions requiring a domain restriction

Graphing and solution of modulus equations and inequalities

Applications SL

Modelling skills and the modelling process

Modelling in contexts with linear, quadratic, exponential growth and decay, direct and inverse variation, cubic, and sinusoidal behaviours.

Applications HL

Composite functions used in context

Inverse functions with domain restrictions

Transformations of functions

Modelling with exponential models with half-life, complex sinusoidal models, logistic models and piecewise models

Linearizing data

Log-log and log-linear graphs

Geometry and Trigonometry

Core

Distance between points in 2d and 3d space

Midpoints of two points in 2d and 3d space

Volume, surface area and angles in 3d solids

Non-right-angled trigonometry, including area of a triangle, angles of elevation and depression

Three figure bearings

Analysis SL

Circles – length of arc and area of sector in radians

The unit circle – exact trigonometric ratios and their multiples

Ambiguous case of the sine rule

Pythagorean identity

Double angle identities for sine and cosine

Behaviour of circular functions

Composite functions of the form $y = a \sin(b(x - c)) + d$

Transformations and real-life contexts

Solving trigonometric equations, including quadratic trigonometric equations, in a finite interval

Analysis HL

Reciprocal trig ratios, Pythagorean identities involving tan, cot, sec and cosec

Inverse trig functions

Double angle identity for tan

Compound angle identities

Relationships between trig functions and their symmetry properties

Vectors – algebraic and geometric approaches, dot and cross products, angle between 2 vectors, vector algebra

Vector equation of a line in 2d and 3d space

Angle between 2 lines

Simple applications of vectors to kinematics

Coincident, parallel, intersecting and skew lines in 2d and 3d space and their points of intersection

Vector product, properties and applications

Vector equations of a plane

Intersections of lines and planes and angles

Applications SL

The circle – length of arc and area of sector

Equations of perpendicular bisectors

Voronoi diagrams – nearest neighbour interpolation and toxic waste dump problems

Applications HL

Radian measure

The unit circle and the Pythagorean identity

Solving trigonometric equations

Inverse trigonometric functions

Geometric transformation in 2d using matrices

Vectors – geometric approaches, dot and cross products, angle between 2 vectors

Vector equation of a line in 2d and 3d space

Angle between 2 lines

Vector applications to kinematics, linear motion with constant and variable velocity

Graph theory

Adjacency and transition matrices

Tree and cycle algorithms including Kruskal's and Prim's, Chinese postman and Travelling Salesman

Statistics and Probability - 1

Core
Concept of population, sample, outliers, discrete and continuous data
Reliability of data sources
Interpretation of outliers
Sampling techniques – simple random, convenience, systematic, quota and stratified sampling methods
Presentation of discrete and continuous data in frequency tables, histograms, cumulative frequency graphs and box plots
Measures of central tendency and dispersion for discrete and continuous data including the effect of multiplication by or addition of a constant
Linear correlation – equation of regression line y on x including piecewise linear models, Pearson's product-moment correlation coefficient
Introduction to probability – independent events, mutually exclusive events, combined events, conditional probabilities and probabilities with and without replacement
Use of Venn diagrams, tree diagrams, sample space diagrams and tables of outcomes
Probability distributions of discrete random variables, expected values and applications
The normal distribution – its properties, diagrammatic representation, expected values, probability and inverse normal calculations
The binomial distribution

Analysis SL

The regression line x on y
Formal treatment of conditional and independent probability formulae
Testing for independence
Standardization of normal variables
Inverse normal calculations

Applications SL

Spearman's rank correlation coefficient
Appropriateness and limitations of different correlation coefficients
Hypothesis testing
Significance levels
Chi squared test for independence and goodness of fit
T-test
One-tailed and two-tailed testing

Statistics and Probability - 2

Analysis HL

Bayes' theorem

Formal treatment of discrete random variables and their probability distributions

Continuous random variables and their probability density functions

Expectation algebra

Applications HL

Data collection techniques, survey and questionnaire design

Reliability and validity tests

Non-linear regression, sum of squares, R^2

Interpolation and extrapolation

Linear transformation of a single random variable, expectation and variance

Unbiased estimate and estimators

Sample means and the central limit theorem

Confidence intervals

Testing for population mean for normal and Poisson distributions, proportion for binomial distribution

Critical regions and values

Type I and II errors

Poisson distribution

Transition matrices including regular Markov chains

Calculus - 1

Core

Introduction to limits, rate of change and gradient

Increasing and decreasing functions and the graphical interpretation of the gradient

Differentiation of polynomials

Equations of tangents and normals at a given point

Integration as anti-differentiation of polynomials

Definite integrals using technology to find areas under curves

Anti-differentiation with a boundary condition to determine the constant term

Analysis SL

Derivatives of $\sin x$, $\cos x$, e^x , and $\ln x$, including their sums and multiples

The chain, product and quotient rules

The second derivative and the graphical relationships between f , f' and f''

Local maximum and minimum points, points of inflexion

Testing for maximum and minimum points

Optimisation

Kinematics problems involving displacement, velocity, acceleration and total distance travelled

Indefinite integration of $\sin x$, \cos , $1/x$ and e^x

Integration by inspection and by substitution

Definite integrals

Analytic evaluation of the areas under curves

Applications SL

Local maximum and minimum points

Optimisation problems

Numerical integration - the trapezoidal rule

Calculus - 2

Analysis HL

Informal treatment of continuity and differentiability at a point

Understanding of limits (convergence and divergence)

Differentiation from first principles; higher order derivatives

L'Hopital's rule

Implicit differentiation

Related rates and optimisation

Derivatives and indefinite integrals of tan, reciprocal and inverse trig functions, the identity function, exponential and log functions, including the composites of these and partial fractions

Integration by substitution and by parts, repeated integration by parts

Volumes of revolution about the x and y axes

First order differential equations – using Euler's method, separation of variables and integrating factor

Maclaurin expansions of e^x , $\sin x$, $\cos x$, $\ln(1+x)$, $(1+x)^p$ and composites of these

Applications HL

Derivatives of $\sin x$, $\cos x$, $\tan x$, e^x , $\ln x$, x^n

Chain, product and quotient rules

Related rates of change

Second derivative testing for concavity

Integration of $\sin x$, $\cos x$, $\sec^2 x$, e^x

Integration by inspection and substitution

Volumes of revolution about the x and y axes

Kinematics – displacement, distance, velocity and acceleration

Setting up and solving first order differential equations

Slope fields

Euler's method for first and second order differential equations

Phase portraits

Questions regarding Maths

- Which subjects will each pathway support?
- Analysis: Pure Maths, Physics
- Applications: Human Sciences/Social Sciences, Biosciences

- Economics?
- Engineering
- Computer Science?

- What do universities need from us?

Engagement with HEI re Maths

- 1:1 with specific universities: UCL, Oxford, ICL, Bristol, Bath, Southampton, Cardiff, KCL, LSE
- Draft specifications to go to them for submission to their academic committees
- Groups of universities:
 - UCAS
 - Russell Group
 - HELOA

DfE Advance Maths Premium

- Announced in budget, precise details released last week:

<https://www.gov.uk/guidance/16-to-19-funding-advanced-maths-premium>

- The advanced maths premium is paid at a rate of £600 per year per **additional** student for one or 2 years, depending on the type and size of qualification studied.
- The premium will first be paid automatically in 16 to 19 funding allocations for the academic year 2019 to 2020. For this payment, the number of additional students will be measured between the average of academic years 2015 to 2016 and 2016 to 2017 and the increase in numbers in academic year 2018 to 2019.
- All IB Maths courses count as they are specifically listed in the accountability measures.

Variable Programme Size



Examples of Course Combinations and outcomes

Triple A Level equivalent CRS

- Extended BTEC Diploma Applied Science, SL Maths St, SL Psychology: Automotive Engineering @ Loughborough
- Extended BTEC Diploma Sport, SL Biology, SL Psychology: Sports, Exercise & Health Science @ Brunel
- Extended BTEC Diploma Health & Social Care, SL Biology, SL Social Anthropology: Midwifery @ Canterbury Christ Church

Double A Level equivalent CRS

- BTEC Diploma Performing Arts, HL Film, SL English Lit: Film & Drama @ Kent
- BTEC Diploma Applied Science, SL History, SL Social Anthropology: Business Management @ Bishop Grosseteste

Single A Level equivalent CRS

- IFS Diploma, HL ITGS, HL Visual Art, A Level English: English Literature @ Greenwich

HEI accepting IBCP students 2014-7



- Anglia Ruskin (2.5)
- Bishop Grosseteste (2)
- Birmingham (3)
- Bournemouth (2)
- Brighton (3)
- Brunel (3)
- Canterbury Christ Church (2)
- Chichester (flexible)
- Coventry (2/3)
- Derby (2)
- Durham (3)
- Edinburgh Napier (3)
- Exeter (3)
- Essex (3)
- Falmouth (flexible)
- Gloucester (2)
- Greenwich (3)
- Hertfordshire (2)
- Kent (3)
- King's College, London (3)
- Kingston (2)
- Lancaster (3)
- Leeds Beckett (2)
- Lincoln (3)
- Loughborough (3)
- Middlesex (3)
- Newcastle (3)
- Northampton (2)
- Northumbria (? States dna CP)
- Nottingham Trent (3)
- Portsmouth (2/3)
- Plymouth (2/3)
- QMUL (3)
- Reading (3)
- Roehampton (3)
- Southampton (3)
- Southampton Solent (2)
- Surrey (3)
- University of the Arts, London (3)
- University of East Anglia (3)
- University of East London (3)
- UCA (3)
- UCL (3)
- Westminster (3)
- Winchester (2)
- York (3)

Note 2 generally means 2 full A Level equivalents **plus** AS equivalents

Subjects studied



- Accounting & Management
- Aeronautical Engineering
- Arabic & English
- Archaeology & History
- Art & Design
- Automotive Engineering
- Business Administration
- Business & Management
- Computer Science
- Creative Arts
- Criminology
- Digital Media
- Drama
- Early Years
- Engineering
- English Literature
- Events Management
- Film
- Forensic Investigation
- Geography
- History
- Independent Games production
- Interior Design
- Journalism
- Law
- Marketing & Advertising
- Media & Film
- Midwifery
- Music Technology
- Nursing
- Palaeobiology
- Paramedic Science
- Performing Arts
- Physics
- Primary Education
- Policing
- Politics
- Sports Management
- Sports Science

MYP equivalence to GCSE

- MYP is Ofqual regulated and is a Level 1/2 qualification
- Graded 1 to 7 in each subject but Ofqual gives no guidance where the boundary between Level 1 and 2 should be
- Most schools still following old format – in school assessment as e-Assessments only introduced in May 2016 and they are waiting to see
- No formal equivalence between MYP and (i)GCSE grades
- IB to develop research in 2017/18. However the key problem is equivalence between what?
- In school moderated MYP, new e-Assessments?
- Old GCSE, reformed GCSE, iGCSE?
- Most likely will be between e-Assessed MYP and iGCSE.
- In the meantime our advice is to use Total IB points and the SL and HL predicted grades as the key attainment evidence.

Events

- 2018 HE Conference: Wednesday 6th June @ The University of Bath
- 2018 CP Conference: Thursday 29th November