

# Curriculum

## I Foundation Programme

12 Credits



All students entering the undergraduate programme complete our common core, The Foundation Programme, in the first year. The Foundation Programme is designed around four Studios, each of three credits. They are:

*Democracy and Justice*

*Environment and Climate Change*

*Neighbourhoods*

*Water*

The studios deliver interdisciplinary learning around six domains:

*Data Science, Communication, Behaviour, Constitution & Civilisation, Materials, and Biology & Life.*

## II General Education Requirement

30 Credits



Humanities and Languages GER

Social Sciences GER

Biological and Life Sciences GER

Mathematical and Physical Sciences GER

Performance and Visual Arts GER

GER Elective 1: Communication- I

GER Elective 2: Communication- II

GER Elective 3: Data Science

GER Elective 4: Any course at the university outside the major

GER Elective 5: Any course at the university outside the major

Major Requirements	Credits
<b>Major Core</b>	<b>36</b>
Probability Mathematical Statistics Discrete Mathematics Design and Analysis of Data structures and Algorithms Applied Linear Algebra /Advanced Linear Algebra Differential Equations Multivariable Calculus Introduction to Real Analysis Machine Learning Artificial intelligence (AI) Mathematical Modelling Introduction to Abstract Algebra	
<b>Undergraduate Thesis</b>	<b>6</b>
<b>Major Electives</b>	<b>18</b>
<u>Pure Mathematics</u>	
Complex Analysis Introduction to Differential Geometry Introduction to Combinatorics Number Theory Introduction to Topology Introduction to Algebraic Topology Introduction to Measure Theory Introduction to Functional Analysis Introduction to Representation Theory Introduction to Commutative Algebra	
<u>Applied Mathematics / Computational Sciences</u>	
Calculus of Variations Graph Theory Introduction to Numerical Analysis Introduction to Partial Differential Equations Mathematical Optimization and Linear Programming Mathematical Modelling of Climate Change Mathematical Ecology Introduction to Fourier Analysis and Its Applications Mathematical Statistics Stochastic Process Python Programming Theory of Computation Statistical Learning Theory Nonlinear Dynamics Mathematical Biology Quantum Mechanics-I Social Network Analysis (SNA) Introduction to Quantum Computing Game Theory and its Applications –I Financial Modelling Financial Econometrics Introduction to Fintech Basic Bioinformatics Computational Structural Biology Natural Language Processing Computer Vision Wireless Communications Information and Coding Theory Data Analytics and Visualisation Big Data Analytics Introduction to Quantum Machine Learning	

#### IV Free Electives

18 Credits



Free Electives provide flexibility to students to customise their education at the University.

Free Electives allow you to take additional courses as per your choice (apart from the Foundation Programme, GERs and Major Requirements), across the university to increase your depth or breadth.

A student can take a Minor in any area designated as a Minor at any School or Centre of the University. Some Minors may have specific pre-requisites. Free Electives can also be used along with some courses from the Major Requirements and GERs towards a Minor.

#### V Volunteerism

Required



All students will complete 30 hours of engagement with society to develop a sense of engagement, concern, build problem solving skills, and understand the role of an engaged member of a society. This will be done through a mandatory course, *Engagement with Society*, that would be a graduation requirement. This course can be taken anytime during the stay at the University but it is advised that the student engage with the courses during the first two years at the University. The 30 hours of volunteer work may be completed during one semester or during the Winter or Summer Break.

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