

Equivalent Course Guide

Updated March 2024

This list does not include core classes, nor does it include option equivalents that are typically taken freshman and/or sophomore year, as such classes should be taken before study abroad commences. Course equivalence is based on similarities in course content and what Caltech Study Abroad students have received credit for in the past – it is by no means guaranteed.

Note that this list does not define all equivalent classes. Just because it is not listed does not mean an equivalent does not exist. It is best, therefore, to also go to the catalog and course lists for each program to determine if an equivalent class is available.

Note that students studying abroad can take classes not taught at Caltech for option elective or general credit. In fact, students are encouraged to do so in order to explore new subjects in their option or in other fields.

Please keep in mind that courses, schedules and professors can change. It is possible that some of these classes are no longer being taught, have been renamed, revised, or are taught in a different term or semester. Simply because a class is listed here does not guarantee that you will receive the credit you are seeking. You MUST still have your professors at Caltech review the current syllabus and course description of each class. The professor who teaches a comparable class at Caltech will decide whether or not you can receive credit equivalent to a required CIT course. Note that you are not required to check equivalence with Caltech instructors/professors until you are selected for a particular program. However, it is advised that you do so in the case of a required class.

Course catalog links for each study abroad program are below:

Cambridge: <https://www.internationalstudents.cam.ac.uk>

Copenhagen: <http://studies.ku.dk/studies/>

- List of departments: <http://introduction.ku.dk/organisation/departments/> - useful for determining classes by department

Danish Technical University: <https://www.dtu.dk/english/Education/Course-base>

Edinburgh University: <http://www.drps.ed.ac.uk/>

Melbourne: <https://handbook.unimelb.edu.au/faces/htdocs/user/search/SimpleSearch.jsp>

University College London: <https://www.ucl.ac.uk/prospective-students/study-abroad-ucl/study-abroad-guide/subjects>

L'Ecole Poly <https://www.polytechnique.edu/en>

EQUIVALENT COURSE GUIDE

Aerospace Engineering

Caltech Course	Cambridge (M)	Cambridge (L)	L 'Ecole Poly	Edinburgh	Copenhagen	Melbourne	UCL	DTU
Ae/Aph/CE/ME 101a								Turbulence Theory (41129)
Ae 105a								Intro to Spacecraft Systems and Design (30300)

Astrophysics

Caltech Course	Cambridge (M)	Cambridge (L)	L 'Ecole Poly	Edinburgh	Copenhagen	Melbourne	UCL	DTU
Ay 20				Astrophysics (PHY10102)				
Ay 21			Stellar Astrophysics (PHYS553)				Stellar Atmospheres & Stellar Winds (PHYS4318)	
Ay 101	Relativistic Astrophysics &							

	Cosmology (Nat Sci III, Physics)							
Ge/Ay 117				Astronomical Statistics & Measurement (PHY10080)				
Ay 190				Computational Astrophysics L11 (PHY11037)				

BEM/Economics

Caltech Course	Cambridge (M)	Cambridge (L)	L 'Ecole Poly	Edinburgh	Copenhagen	Melbourne	UCL	DTU
BEM 103					Introduction to Financial Engineering (42104)			
BEM 105	Stochastic Financial Models (Ma IID)	Stochastic Financial Models (Ma IID)					Financial Math (MATH3508)	
Ec 122				Essentials of Economics (ECNM1005 2)	Econometrics 2: Statistic Analysis of Econometric Time Series			

Bioengineering

Caltech Course	Cambridge (M)	Cambridge (L)	L'Ecole Poly	Edinburgh	Copenhagen	Melbourne	UCL	DTU
BE/Bi 103		Medical Physics (Engineering IIB)						
BE/Bi 129	Pathophysiology of Cancer (P7 PDN II)							
BE 153		Systems and Clinical Physiology (P8 PDN II) Mathematical Physiology (3G2)						
BE 159						Cell Signaling and Neurochemistry (BCMB 30004)		
Aph/BE 161								
ChE/BE 163	Introduction to Molecular Bioengineering (3G1)							Metabolic Engineering & Functional Genomics (27405)
Bi/BE 182		Development: Cell Differentiation						

		and Organogenesis						
EE/BE/MedE 185					Introduction to Micro-Mechanical Systems Design and Manufacture (41742)			Micro-2: Micro-electro-mechanical Systems (33355)

Biology

Caltech Course	Cambridge (M)	Cambridge (L)	Edinburgh	Copenhagen	Melbourne	UCL	DTU	Chicago
Bi 1				Biomolecular Chemistry (26422)			Biomolecular Chemistry (26422)	
BE/Bi 103		Medical Physics (Engineering IIB)						
Ch/Bi 110			Biomacromolecules (CHEM 10051) Structures and Functions of Proteins (BILG09015) Biophysical Chemistry			Biological Chemistry (CHEM3202) General Biochemistry (BIOC1008)		

			(CHEM 10014) Molecular Microbiology 3 L9 (BILG 09013) Clinical Biochemistry & Endocrinology 5 (UO1124)					
Bi/Ch 113	Cell Assembly & Interactions (P9 PDN Pt II)					Advanced Molecular Cell Biology (BIOC3050) Molecular Cell Biology (BIOL3006/A NAT 3050)		
Bi 117		Development: Cell Differentiation & Organogenesis (P6 Nat Sci II, PDN)						
Bi 118		Pluripotency & Differentiation						
Bi 122			Molecular	Theoretical				

			Genetics 3 L9 (BILG09002) Evolutionary & Ecological Genetics 3 (BILG09004)	Molecular Genetics				
Bi/BE 129	Pathophysio logy of Cancer (P7 PDN II)							
Bi 145a						Animal & Human Physiology- Maintenance & Regulatory Mechanisms (PHOL2002)		Principl es of Physiol ogy (BIOS 20242)
Bi/CNS/NB/ Psy 150	Molecular Neuroscience (N2, Nat Sci II) Sensory Transduction (N4, Nat Sci II) Control of Action (N3, Nat Sci II)	Introduction to Neuroscience (3G3)		Neurobiology (KU)		Advanced Neuroanatomy (ANAT3025) Advanced Functional Anatomy (NEUR3025)		
Bi/CNS/EE 156a			Introductory Applied Machine					

			Learning (INFR10069)					
Bi 153		Systems and Clinical Physiology						
ESE/Bi 166			Molecular Microbiology (BILG09013)					
BMB/Bi/Ch 170						Chemistry of Biologically Important Molecules (CHEM2601)		
Bi/BE 182		Development: Cell Differentiation & Organogenesis						
CNS/Bi/EE/ C S/NB 186	Computer Vision (4F12)							
CNS/Bi/NB 256		Central Mechanisms of Reward, Punishment, and Emotion (N6 PDNII)						

Chemical Engineering

155								& Kinetics
ChE/BE 163	Introduction to Molecular Bioengineering (3G1)							Metabolic Engineering & Functional Genomics (27405)

Chemistry

Caltech Course	Cambridge (M)	Cambridge (L)	Edinburgh	Copenhagen	Melbourne	UCL	DTU	Chicago
Ch 21a			Foundations of Quantum Mechanics (PHYS09051)			Quantum Mechanics & Spectroscopy (CHEM2304) Physical Chemistry (CHEM2301)	Advanced Physical Chemistry (26236) Quantum Chemistry (26261)	
Ch 21b			Chemistry 3A (VS1) Level 9 (CHEM0900 8)					
Ch 25			Biophysical Chemistry (CHEM1101 6)				Biomolecul ar Chemistry (26422)	
Ch 41a			Synthetic			Organic	Practical	

			Organic Chemistry (CHEM10024)			Chemistry (CHEM2201) Fundamentals of Organic Chemistry (CHEM2202) Chemistry for Biology Students (CHEM1062)	Organic Chemistry (26407) Organic Chemistry 3 (26433)	
Ch 80						Chemistry Research Project (CHEM40008)		
Ch/Bi 110			Biomacromolecules (CHEM10051) Structures and Functions of Proteins (BILG09015) Biophysical Chemistry (CHEM10014) Molecular Microbiology 3 L9 (BILG			Biological Chemistry (CHEM3202) General Biochemistry (BIOC1008)		Introduction to Biochemistry (BIOS20200)

			09013) Clinical Biochemistry & Endocrinolog y 5 (UO1124)					
Bi/Ch 113	Cell Assembly & Interactions (P9 PDN Pt II)					Advanced Molecular Cell Biology (BIOC3050) Molecular Cell Biology (BIOL3006/A NAT 3050)		
Ch 120a		Energy Landscapes and Soft Materials (M4 Ch PT III)				Chemistry of Materials (CHEM2001)		
Ch 121a	Computer Simulation Methods in Chemistry & Physics (M6)							
Ch 125a				Mathema tics & Introductor y Quantum Mechanics		Topics in Quantum Mechanics (CHEM3302)		

Ch 143							NMR Spectroscopy (26438)	
Ch 144a	Organic Solids (M10 Ch PT III)							
Ch 145						Chemistry of Biologically Important Molecules (CHEM2601)		
Ch/ChE 147	Introduction to Polymers (M0 Ch PT III)					Chemistry of Materials (CHEM2001)		
Ch/ChE 148							Polymer Technology (28213)	
Ch 154a	Main Group Organometallics (M8 Ch PT III)							
ChE/Ch 155							Catalysis & Kinetics	
BMB/Bi/Ch 170						Chemistry of Biologically Important Molecules (CHEM2601)		
ESE/Ge/		Atmospheric						

Ch 171		Chemistry & Global Change						
ESE/Ch 175				Environmental Chemistry (CHEM10048)				
ESE/Ch 176				Environmental Chemistry (CHEM10048)				
Ch 242a	Stereocontrolled Organic Synthesis (M5 Ch PT III)					Principles & Methods of Organic Synthesis (CHEM3205)		

Computational and Neural Systems (CNS)

Caltech Course	Cambridge (M)	Cambridge (L)	Edinburgh	Copenhagen	Melbourne	UCL	DTU	Chicago
Bi/CNS/NB/ Psy 150	Molecular Neuroscience (N2, Nat Sci II) Sensory Transduction (N4, Nat Sci II)	Introduction to Neuroscience (3G3)		Neurobiology (KU)		Advanced Neuroanatomy (ANAT3025) Advanced Functional Anatomy (NEUR3025)		

	Control of Action (N3, Nat Sci II)							
Bi/CNS/EE 156a			Introductory Applied Machine Learning (INFR10069)					
CS/CNS 171	Computer Graphics and Image Processing (CS PT II)					Computer Graphics (COMP0027)		
CNS/Bi/EE/CS/NB 186	Computer Vision (4F12)							
CNS 187			Computational Neuroscience (INFR11209)					
CNS/Bi/NB 256		Central Mechanisms of Reward, Punishment, and Emotion (N6 PDNII)						

Computer Science

Caltech	Cambridge	Cambridge (L)	Edinburgh	Copenhagen	Melbour	UCL	DTU	Chicago
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Course	(M)				ne			
CS 1			Programming and Data Analysis (PHYS08049)					
CS 2						Concurrent Programming (COMP2007)		
CS 3			Informatics 2C- Introduction to Software Engineering (INFR08019)					
CS 11			Introduction to Java Programming Level 9 (INFR09021)					
CS 121	Databases (CS 1A)							
Ma/CS 6/106a	Graph Theory (Ma PT IID) Number Theory (Ma PT IIC)		Discrete Mathematics & Mathematical Reasoning (INFR08023)	Discrete Mathematical Structures				
Ma/CS 6c	Automata and Formal Languages (Math IIC)							

CS/EE/ME 134			Introduction to Vision and Robotics Level 9 (INFR09019)					
EE/CS/EST 135				Electric Power Engineering (31730)				
CS 142	Concurrent and Distributed Systems							
CS/EE/IDS 143	Principles of Communicatio ns (CS II)					Networked Systems (COMP3035)	Computer Networks & the Internet (62472)	
CS/CNS/EE 156a			Introductory Applied Machine Learning (INFR10069)					
ACM/CS/ID S 157		Statistical Modelling (Ma IIC)						
CS 165			Machine Learning and Patte... (INFR11130)					
CS/CNS 171	Computer Graphics and Image					Computer Graphics (COMP0027)		

	Processing (CS PT II)							
CNS/Bi/EE/ CS/NB 186	Computer Vision (4F12)							
Ph/CS 219			Introduction to Quantum Cor... (INFR11099)					

Electrical Engineering

Caltech Course	Cambridge (M)	Cambridge (L)	Edinburgh	Copenhagen	Melb ourne	UCL	DTU	Chicago
APh/EE 9			Group Design Project (Design of Microsystems)					
ACM/EE 106a	Numerical Analysis (Ma Pt IID)		Numerical Linear Algebra & Applications (MATH11196)					
ACM/EE 106b	Fluid Dynamics (Ma PT IB)							
ME/EE/EST 109			Sustainable Energy Technologies 4 (MECE10011)					
EE 111	Signals &		Signals & Linear					

	Systems (3F1)		Systems in Discrete Time (31606)					
EE 112			Digital Signal Analysis 4 Level 10 (ELEE10010)					
ACM/EE/IDS 116				Stochastic Processes (02407)				
CS/EE/ME 134			Introduction to Vision and Robotics Level 9 (INFR09019)					
EE/CS/EST 135				Electric Power Engineering (31730)				
CS/EE/IDS 143	Principles of Communications (CS II)					Networked Systems (COMP3035)	Computer Networks & the Internet (62472)	
CS/CNS/EE 156a			Introductory Applied Machine Learning (INFR10069)					
EE 160	3F7 Information Theory and Coding (Eng IIB)							
EE/BE/Med				Introduction			Micro-2:	

E 185				to Micro-mechanical Systems Design & Manufacture (41742)			Micro-Electro-Mechanical Systems (33355)	
CNS/Bi/EE/ CS/NB 186	Computer Vision (4F12)							

Environmental Science and Engineering

Caltech Course	Cambridge (M)	Cambridge (L)	Edinburgh	Copenhagen	Melbourne	UCL	DTU	Chicago
ESE/ChE 158			Atmospheric Physics (METE10002)					
ESE/Bi 166			Molecular Microbiology (BILG09013)					
ESE/Ge/Ch 171		Atmospheric Chemistry & Global Change						

Geological and Planetary Science

Caltech	Cambridge	Cambridge (L)	Edinburgh	Copenhagen	Melbourne	UCL	DTU	Chicago
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Course	(M)							
GE 11a						The Earth (GEOL1003)		
GE 104			Land-Atmosphere Interactions Level 10 (ECSC10014)					
GE 112	Sedimentology & Paleontology Core (Nat Sci II, Geological Sciences)	Sedimentary Systems (Nat Sci II, Geological Sciences)	Paleontology & Sedimentology L10 (EASC10106) Dynamic Stratigraphy (EASC10097)	Sedimentary Basins-Modeling, Stratigraphy & Resources	Sedimentary Geology (GEOL30003)			
GE 114a	Mineralogy Core-Dynamics of Atoms in Minerals (Nat Sci II, Geological Sciences)							
GE 114b		Mineralogy of the Deep earth (Nat Sci II, Geological Sciences)						
GE/Ay 117			Astronomical Statistics & Measurement (PHYS10080)					
GE 166			Hydrogeology 1:					

			Applied Hydrogeology Level 10 (EASC 10082)					
ESE/GE/Ch 171		Atmospheric Chemistry & Global Change						

Geological and Planetary Science

Caltech Course	Cambridge (M)	Cambridge (L)	Edinburgh	Copenhagen	Melbourne	UCL	DTU	Chicago
MS 115			Chemistry of Functional Materials (CHEM10041)					
MS 133	Rheology & Processing (ChE IIB)							

Math/ACM

Caltech Course	Cambridge (M)	Cambridge (L)	Edinburgh	Copenhagen	Melbourne	UCL	DTU
Ma 5/105a	Groups (Math IA)		Algebra (U01617)	Algebra 2 Modern Algebra			

Ma 5/105b		Group Rings & Modules (Math IB)					
Ma/CS 6/106a	Graph Theory (Ma PT IID) Number Theory (Ma PT IIC)		Discrete Mathematics & Mathematical Reasoning (INFR08023)	Discrete Mathematical Structures			
Ma 7	Number Theory						
Ma 108a	Analysis II (Math IB)		Honours Analysis L10 (MATH10068) Metric Spaces (U01630) Pure & Applied Analysis (U01634)				
Ma 108b		Analysis of Function (Ma IID)					
Ma 109a		Geometry (Ma IIB)		Topology (MATH10077)	Topology		
Ma 109b		Differential Geometry (Math II) Geometry (Math IB)					

Ma 110a	Linear Analysis						
Ma 112a	Principles of Statistics (Math PT IID)	Statistics (Ma IID)					Multivariate Statistics (02409)
Ma 140a	Probability and Measure						
Ma/SS 142		Stochastic Financial Models (Math IID)					
Ma 144a	Graph Theory (IID)						
Ma 145a	Representation Theory						
ACM 95a	Complex Analysis & Optimization (4M13, Engineering IIA)		Complex Variable & Differential Equations (U01611)				Multivariate Statistics (02409)
ACM 95b		Complex Methods (Math IB)					
ACM/IDS 101ab			Advanced Methods of Applied Mathematics L10 (MATH 10086)				

			Differential Equations (Math 10066)				
ACM 105		Analysis of Functions (Math IID)					
ACM/EE 106a	Numerical Analysis (Ma Pt IID)		Numerical Linear Algebra (MATH10098)				
ACM/EE 106b	Fluid Dynamics (Ma PT IB)						
ACM/CMS/IDS 113	Optimization and Control (Ma PT IID)		Non-Linear Optimization (U02703)				
ACM/EE/IDS 116				Stochastic Processes (02407)			
Ma 121a	Graph Theory (Ma PT IID)	Graph Theory (Ma IID)	Database Systems L10 (INFR10070)				
ACM/CS/IDS 157		Statistical Modeling (Ma IIC)					
ACM/IDS 216		Statistical Modeling (Ma PT IIC)					

Mechanical Engineering

Caltech Course	Cambridge (M)	Cambridge (L)	L'Ecole Poly	Edinburgh	Copenhagen	Melbourne	UCL	DTU
ME 72a				Mechanical Design Project (MECE09018)				
Me/APh/CE/ME 101a								Turbulence Theory (41129)
ME/EE/EST 109				Sustainable Energy Technologies 4 (MECE10011)				
Ae/ACM/Me 232a			Computational Fluid Dynamics					

Physics/Applied Physics

Caltech Course	Cambridge (M)	Cambridge (L)	L'Ecole Poly	Edinburgh	Copenhagen	Melbourne	UCL	DTU
Ph 5				Electronic Methods in the Physical Laboratory (U01361) Electronic Methods in the Physical Laboratory				

				(PHYS09023)				
APh/EE 9				Group Design Project (Design Microsystems) (SCEE11004)				
APh 17a				Thermodynamics & Statistical Mechanics, Thermodynamics 3 (U03272)				Statistical Physics (10122)
Me/APh/CE/ME 101a								Turbulence Theory (41129)
Ph 101				Physics Skills (PHYS10042)				
Ph 106a	TP1 Theoretical Physics I (Nat Sci II, Physics) Classical Dynamics (Math II)			Lagrangian Dynamics L10 (PHYS10015)				
Ph 106b		Theoretical Physics (Nat Sci II, Physics)						
Aph 114a				Chemistry of Functional Materials (CHEM10041)				

				Condensed Matter Physics (PHYS10099)				
Ph 125a	Advanced Quantum Physics (Nat Sci II, Physics) Principles of Quantum Mechanics (Math IID)			Foundations of Quantum Mechanics (PHYS09051) Quantum Physics (PHYS10043) Quantum Theory (PHYS11019)			Atom & Photon Physics (PHYS4421) Advanced Quantum Mechanics (PHYS4226)	Advanced Quantum Mechanics (10112)
Ph 127a	Thermal & Statistical Physics (Nat Sci II, Physics) Statistical Mechanics (Nat Sci II, Physics)			Statistical Physics (PHYS11024)				Statistical Physics (10400)
Ph 129c			Symmetry Groups in Physics					
Ph 135			Physics of Elementary Particles (PHY554) Quantum	Introduction to Condensed Matter Physics (PHYS10099)				

			Optics-Lasers (PHY551A)					
APh 156a								Plasma Physics (10400)
APh/BE 161								Intro to Biophysics (10347)
Ph 205a	Particle Physics (Nat Sci III, Physics) Quantum Field Theory (Nat Sci III, Physics)							
Ph/CS 219				Introduction to Quantum Cor... (INFR11099)				
Ph/APh 223a	Quantum Condensed Matter Field Theory (Nat Sci II, Physics) Advanced Quantum Condensed							

	Matter Physics (Nat Sci III, Physics)							
Ph 236a	Relativity (Nat Sci II, Physics)							