THE CHINESE UNIVERSITY OF HONG KONG

X and Materials Science and Engineering (CUHK) Double Major Programme

Lists of Substitute / Equivalent / Alternative Courses between CUHK and CUHK(SZ)

(As of 22 January 2025)

(for students admitted by CUHK(SZ))

Note:
The substitute / equivalent / alternative coursers are not transitive. If Courses A and B are substitute / equivalent / alternative courses, and courses A and C are substitute / equivalent / alternative courses, it does not necessarily follow that B and C are also substitute /equivalent / alternative courses. Nonetheless, students should not take both courses B and C.

Faculty Package

Courses offered by CUHK(SZ)		Courses offered by CUHK	
CSC1005	Intro to Computer Engineering - Programming & Applications	ENGG1110	Problem Solving by Programming
MAT1001	Calculus I	ENGG1125	Single Variable Calculus for Engineers
MAT1001	Calculus I	MATH1010	University Mathematics
MAT1001	Calculus I	MATH1510	Calculus for Engineers
PHY1001	Mechanics	PHYS1110	Engineering Physics: Mechanics and Thermodynamics
PHY1001	Mechanics	PHYS1111	Introduction to Mechanics, Fluids, and Waves (University Physics I)

1st Major: Chemistry (offered by CUHK(SZ))

Courses offered by CUHK(SZ)		Courses offered by CUHK	
CHM1001	General Chemistry	CHEM1070	Principles of Modern Chemistry
CHM1011	Honours General Chemistry	CHEM1070	Principles of Modern Chemistry
CHM2002	Physical Chemistry	CHEM2300	Thermodynamics and Chemical Equilibrium
CHM2002	Physical Chemistry	CHEM3320	Chemical Kinetics
CHM2110	Analytical Chemistry	CHEM2400	Analytical Chemistry

CHM2118	Analytical Chemistry Laboratory	CHEM2870	Integrated Chemistry Laboratory II
CHM2210	Inorganic Chemistry	CHEM2120	Main Group Chemistry
CHM2210	Inorganic Chemistry	CHEM3130	Transition Metal Chemistry
CHM2228	Inorganic Chemistry Laboratory	CHEM2868	Basic Integrated Chemistry Laboratory
CHM2310	Organic Chemistry I	CHEM2200	Organic Functional Groups: Structure and Reactivity
CHM2320	Organic Chemistry II	CHEM3220	Organic Reactions: Reactivity and Selectivity
CHM2338	Organic Chemistry Laboratory	CHEM2868	Basic Integrated Chemistry Laboratory
CHM3110	Advanced Analytic Chemistry and Experiments	CHEM4400	Advanced Analytical Chemistry
CHM3130	Fundamentals of Spectroscopy, Microscopy and Chromatography	CHEM2110	Fundamentals of Spectroscopic Analysis
CHM3210	Advanced Inorganic Chemistry	CHEM4100	Advanced Inorganic Chemistry
CHM3320	Advanced Organic Chemistry: Reactivity, Structures, Mechanisms and Experiments	CHEM3220	Organic Reactions: Reactivity and Selectivity
CHM3418	Physical Chemistry Laboratory	CHEM3830	Physical Chemistry Laboratory I
CHM3418	Physical Chemistry Laboratory	CHEM3840	Physical Chemistry Laboratory II
CHM3420	Advanced Physical Chemistry (Structural Chemistry)	CHEM4300	Advanced Physical Chemistry
CHM4210	Transition Metals and Coordination Chemistry	CHEM3130	Transition Metal Chemistry
CHM4330	Organometallic Chemistry and Catalysis	CHEM4110	Frontier Organometallic Catalysis
CHM4340	Modern Organic Synthesis	CHEM4110	Frontier Organometallic Catalysis
CHM4340	Modern Organic Synthesis	CHEM4785	Industrial Chemistry
CHM4340	Modern Organic Synthesis	CHEM4730	Special Topics in Chemistry
CHM4410	Solid State Chemistry	CHEM4300	Advanced Physical Chemistry
CHM4422	Chemical Kinetics and Catalysis	CHEM3320	Chemical Kinetics
CHM4510	Undergraduate Special Project	CHEM4040	Undergraduate Special Project
CHM4530	Undergraduate Thesis	CHEM4040	Undergraduate Special Project

CHM4630	Medicinal Chemistry	CHEM4640	Pharmaceutical Chemistry
MAT1002	Calculus II	ENGG1130	Multivariable Calculus for Engineers
MAT1002	Calculus II	MATH2010	Advanced Calculus I
MAT2001	Honours Ordinary Differential Equations	MATH3270	Ordinary Differential Equations
MAT2040	Linear Algebra	ENGG1120	Linear Algebra for Engineers
MSE3023	Materials General Laboratory II	MASE1801	Materials Laboratory
PHY1002	Physics Laboratory	PHYS1712	Physics Laboratory I
PHY1002	Physics Laboratory	PHYS2711	Physics Laboratory II
PHY1010	Principles of Physics II (thermodynamics and EM)	PHYS2041	University Physics III – Introduction to Heat and Electromagnetism
PHY1910	Physics Laboratory I	PHYS1712	Physics Laboratory I
PHY2020	Principles of Physics III (Optics and Modern Physics)	PHYS1122	University Physics II – Introduction to Optics and Modern Physics
STA2001	Probability and Statistics I	ENGG2780	Statistics for Engineers

1st Major: New Energy Science and Engineering (offered by CUHK(SZ))

Courses offered by CUHK(SZ)		Courses offered by CUHK	
CHM1001	General Chemistry	CHEM1070	**Principles of Modern Chemistry**
CHM1002	Chemistry Laboratory	CHEM1870	Chemistry Laboratory: STEM and Daily Life
CHM1011	Honours General Chemistry	CHEM1070	Principles of Modern Chemistry
CHM2002	Physical Chemistry	CHEM2300	Thermodynamics and Chemical Equilibrium
CHM2002	Physical Chemistry	CHEM3320	Chemical Kinetics
CHM2110	Analytical Chemistry	CHEM2400	Analytical Chemistry
CHM2210	Inorganic Chemistry	CHEM2120	Main Group Chemistry
CHM2210	Inorganic Chemistry	CHEM3130	Transition Metal Chemistry
CHM2310	Organic Chemistry I	CHEM2200	Organic Functional Groups: Structure and Reactivity
ECE2001	Basic Circuit Theory	ELEG2202	Fundamentals of Electric Circuits
ECE4010	Machine Intelligence and Applications	CSCI3230	Fundamentals of Artificial Intelligence

ENE3003	Heat and Mass Transfer for Energy Systems	EEEN2040	Heating, Ventilation, and Air-Conditioning (HVAC) I
ENE3004	Fundamentals of Photovoltaic Materials and Devices	EEEN4020	Solar Energy and Photovoltaic Technology
ENE3005	Fundamentals of Electrochemistry and Batterie	EEEN4050	Energy Storage Devices and Systems
ENE3050	Electrical Power Systems	ELEG3601	Introduction to Electric Power Systems
ENE4001	Green Engineering and Environmental Compliance	EEEN4070	Green Building and Sustainable Technologies
ENE4001	Green Engineering and Environmental Compliance	EESC4240	Air Pollution Science and Engineering
ENE4003	Fundamentals of Thermal Energy Systems	EEEN2020	Renewable Energy Technologies
ENE4005	Energy Resources and the Environment	EEEN2020	Renewable Energy Technologies
ENE4005	Energy Resources and the Environment	EEEN3020	Energy Utilization and Human Behaviour
ENE4007	Energy Economics	EEEN2030	Energy and Environmental Economics and Management
ENE4008	Power Electronics	ELEG3207	Introduction to Power Electronics
ENE4009	Power System Stability and Control	EEEN4060	Energy Distribution
ENE4011	Smart Grid	EEEN4060	Energy Distribution
ERG4902	Capstone Project II	EEEN4999	Final Year Project II
MAT1002	Calculus II	ENGG1130	Multivariable Calculus for Engineers
MAT1002	Calculus II	MATH2010	Advanced Calculus I
MAT2002	Ordinary Differential Equations	MATH3270	Ordinary Differential Equations
MAT2040	Linear Algebra	ENGG1120	Linear Algebra for Engineers
MAT3007	Optimization	MAEG4070	Engineering Optimization
MAT3007	Optimization	MATH4230	Optimization
PHY1002	Physics Laboratory	PHYS1712	Physics Laboratory I
PHY1002	Physics Laboratory	PHYS2711	Physics Laboratory II
PHY1010	Principles of Physics II (thermodynamics and EM)	PHYS2041	University Physics III – Introduction to Heat and Electromagnetism

1st Major: Physics (offered by CUHK(SZ))

Courses offered by CUHK(SZ)		Courses offered by CUHK	
CHM1001	General Chemistry	CHEM1070	Principles of Modern Chemistry
CHM1011	Honours General Chemistry	CHEM1070	Principles of Modern Chemistry
CSC3002	C/C++ Programming	CSCI1120	Introduction to Computing Using C++
ECE4010	Machine Intelligence and Applications	CSCI3230	Fundamentals of Artificial Intelligence
MAT1002	Calculus II	MATH2010	Advanced Calculus I
MAT1002	Calculus II	PHYS2051	Quantitative Methods for Basic Physics
MAT2040	Linear Algebra	ENGG1120	Linear Algebra for Engineers
MAT3007	Optimization	MAEG4070	Engineering Optimization
MAT3007	Optimization	MATH4230	Optimization
PHY1010	Principles of Physics II (thermodynamics and EM)	PHYS2041	University Physics III – Introduction to Heat and Electromagnetism
PHY1910	Physics Laboratory I	PHYS1712	Physics Laboratory I
PHY1920	Physics Laboratory II	PHYS2711	Physics Laboratory II
PHY2002	Thermodynamics	PHYS3031	Thermodynamics and Statistical Physics
PHY2020	Principles of Physics III (Optics and Modern Physics)	PHYS1122	University Physics II – Introduction to Optics and Modern Physics
PHY2610	Mathematical Methods in Physics I	PHYS3051	Methods in Theoretical Physics I
PHY2650	Computational Physics and AI Tools	PHYS2061	Basic Computational Physics
PHY2910	Physics Laboratory III	PHYS2722	Physics Laboratory III
PHY3110	Classical Mechanics I	PHYS3011	Classical Mechanics I
PHY3210	Experimental Physics Project Experience	PHYS3710	Short Experimental Project I
PHY3230	Theoretical Physics Project Experience I	PHYS3810	Short Theoretical Project I
PHY3310	Electromagnetic Theory I	PHYS3041	Electromagnetic Theory I
PHY3320	Electromagnetic Theory II	PHYS4041	Electromagnetic Theory II

PHY3410	Quantum Mechanics and its Applications I	PHYS3021	Quantum Mechanics I
PHY3421	Introduction to Quantum Information	PHYS3023	Introduction to Quantum Information Physics
PHY3610	Mathematical Methods in Physics II	PHYS4051	Methods in Theoretical Physics II
PHY3650	Computer Simulation of Physical Systems	PHYS3061	Introduction to Computer Simulation of Physical Systems
PHY4001	Solid-State Physics	PHYS4050	Solid-State Physics
PHY4002	Electrodynamics II	PHYS4041	Electromagnetic Theory II
PHY4270	Senior Project I	PHYS4610	Senior Project I
STA2001	Probability and Statistics	ENGG2780	Statistics for Engineers
STA4001	Stochastic Process	MATH4240	Stochastic Processes

1st Major: Biomedical Science and Engineering (offered by CUHK(SZ))

Courses offered by CUHK(SZ)		Courses offered by CUHK	
BIM3001	Bioinformatics	BMEG3102	Bioinformatics
BIM3006	Macromolecular and Molecular Pharmacology	BCHE3050	Molecular Biology
BIO1001	General Biology	LSCI1002	Introduction to Biological Sciences
BIO2002	Cell and Molecular Biology	BIOL2120	Cell Biology
BIO2004	Biochemistry	BCHE2030	Fundamentals of Biochemistry
BIO2101	Comprehensive Biology Laboratory	LSCI2002	Basic Lab Techniques in Life Sciences
BIO2101	Comprehensive Biology Laboratory	BIOL3012	Biodiversity Laboratory I
BIO3213	Protein Structure Analysis and Proteomics	CMBI4203	Proteomics
BIO3214	Neurobiology	BMEG3330	Neuro engineering
BIO4203	Immunology	BCHE4060	Basic and Applied Immunology
BME2001	Anatomy/Physiology	BIOL3630	Animal Physiology
BME3200	Biomedical Signal Processing	BMEG2300	Circuits and Signals for Biomedical Engineering
BME3001	Introduction to Biomedical Engineering I	BMEG2001	Introduction to Biomedical Engineering

BME3201	Biomedical Instrument Design	BMEG3111	Medical Instrumentation and Design
BME4003	Systems Bioengineering II: Neural System	BCHE4040	Aspects of Neuroscience
BME4007	Tissue Engineering	BMEG3430	Biomaterials and Tissue Engineering
BME4008	Biomechanics of the Human Body	BMEG2210	Orthopedic Biomechanics and Musculoskeletal Injury
BME4009	Clinical Laboratory Science	SBMS2105	Laboratory Techniques in Biomedical Sciences
BME4011	Nanobiotechnology	BMEG4450	Bionanotechnology
CHM1001	General Chemistry	CHEM1070	Principles of Modern Chemistry
CHM1002	Chemistry Laboratory	CHEM1870	Chemistry Laboratory: STEM and Daily Life
CHM1011	Honours General Chemistry	CHEM1070	Principles of Modern Chemistry
CHM2317	Organic Chemistry and Biomolecules	CHEM1280	Introduction to Organic Chemistry and Biomolecules
CSC1002	Computational Laboratory	ENGG1110	Problem Solving By Programming
CSC1004	Computational Laboratory Using Java	CSCI1130	Introduction to Computing Using Java
CSC1004	Computational Laboratory Using Java	CSCI1530	Computer Principles and Java Programming
CSC1006	Artificial Intelligence for Science and Engineering	AIST1000	Introduction to Artificial Intelligence and Machine Learning
MAT1002	Calculus II	MATH2010	Advanced Calculus I
MAT1002	Calculus II	MATH3270	Ordinary Differential Equations
PHY1002	Physics Laboratory	PHYS1712	Physics Laboratory I
PHY1002	Physics Laboratory	PHYS2711	Physics Laboratory II
PHY1010	Principles of Physics II (thermodynamics and EM)	PHYS2041	University Physics III – Introduction to Heat and Electromagnetism
STA2001	Probability and Statistics	ENGG2780	Statistics for Engineers

2nd Major: Materials Science and Engineering (offered by CUHK) – Required Courses

Courses offered by CUHK		Courses offered by CUHK(SZ)	
ELEG3301	Principles of Semiconductor Devices	MSE4570	Semiconductors and Devices
MASE1001	Introduction to Materials Science and Engineering I	MSE2012	Micro and Nano Structures of Materials
MASE1001	Introduction to Materials Science and Engineering I	CHM3520	Introduction to Materials Science and Engineering
MASE1002	Introduction to Materials Science and Engineering II	MSE2021	Materials Mechanics
MASE1002	Introduction to Materials Science and Engineering II	BME3006	Biosensors and Medical Devices
MASE1801	Materials Laboratory	MSE2003	Materials Laboratory I
MASE2002	Introduction to Polymer Science	MSE3408	Polymer Physics and Processing
MASE2002	Introduction to Polymer Science	CHM3530	Polymer Chemistry
MASE2202	Metals and Ceramics	MSE3009	Advanced Ceramics
MASE2601	Technology, Society and Engineering Practice	MSE3011	Engineering Economics and Management

2nd Major: Materials Science and Engineering (offered by CUHK) – Elective Courses

Courses offered by CUHK		Courses offered by CUHK(SZ)	
CHEM4303	Introduction to Nanoscience and Nanotechnology	MSE4005	Nanoscale Materials
ELEG3301	Principles of Semiconductor Devices	PHY3006	Physics of Semiconductors Devices
MASE3002	Characterization of Materials	PHY4960	Methods of Materials Characterization
MASE4102	Photonic Materials and Devices	MSE4650	Optoelectronics Materials
MASE4204	AI Assisted Design and Manufacturing	CHM4342	AI for Chemistry
MASE4206	Electrochemical Corrosion	ENE3005	Electrochemical Energy Conversion
MASE4208	Introduction to Materials Simulation	MSE3405	Computational Materials
MASE4302	Materials and Sustainability	MSE3404	Environmental Materials