THE CHINESE UNIVERSITY OF HONG KONG

<u>Aerospace Science and Earth Informatics & X Double Major Programme</u>

<u>Lists of Substitute / Equivalent / Alternative Courses between CUHK and CUHK(SZ)</u>
<u>(for 2024-25)</u>

<u>(for students admitted by CUHK)</u>

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		Courses offered by CUHK(SZ)	
ENGG1110	Problem Solving by Programming	CSC1001	Introduction to Computer Science: Programming Methodology
GRMD1401	A World of Diversity	URM2010	Cities, Society and Environment
MATH1010	University Mathematics	MAT1001	Calculus I
MATH1510	Calculus for Engineers	MAT1001	Calculus I
MATH1520	University Mathematics for Applications	MAT1001	Calculus I

1st Major: Aerospace Science and Earth Informatics – Required Courses

Courses offered by CUHK		Courses offered by CUHK(SZ)	
ENGG1120	Linear Algebra for Engineers	MAT2040	Linear Algebra
GRMD2104	Remote Sensing of Environment	URM2110	Introduction to Urban Remote Sensing
GRMD2105	Introduction to GIS	URM2040	Principles and Application of GIS in Urban Management
PHYS1110	Engineering Physics: Mechanics and Thermodynamics	PHY1001	Mechanics
PHYS1111	Introduction to Mechanics, Fluids and Waves (University Physics I)	PHY1001	Mechanics

1st Major: Aerospace Science and Earth Informatics – Elective Courses (covering all areas)

Please refer to the study scheme for the elective courses specific to each area of study.

Courses offered by CUHK		Courses offered by CUHK(SZ)	
CHEM1070	Principles of Modern Chemistry	CHM1001	General Chemistry
EEEN2030	Energy and Environmental Economics and Management	ENE4007	Energy Economics
EEEN3030	Engineering Materials	ENE3006	Materials for Energy Applications
EEEN4020	Solar Energy and Photovoltaic Technology	ENE3004	Design of Solar Energy Conversion Systems
EEEN4050	Energy Storage Devices and Systems	ENE3005	Electrochemical Energy Conversion
EESC3800	Global Environmental Change	GLB3060	Global Change and Environmental Sustainability
EESC4510	Statistical Methods and Data Analysis for Earth and Environmental Sciences	STA3020	Statistical Inference
EESC4520	Numerical Methods and Modeling for Earth and Environmental Sciences	DDA3005	Numerical Methods
ELEG2202	Fundamentals of Electric Circuits	ECE2001	Basic Circuit Theory
ELEG3207	Introduction to Power Electronics	ENE4008	Power Electronics
ELEG3601	Introduction to Electric Power Systems	ENE3050	Electrical Power Systems
ENGG2020	Digital Logic and Systems	ECE2050	Digital Logic and Systems
GRMD3203	Urban Environmental Problems	URM3030	Urban Environmental Management and Policy
GRMD3302	Population and Migration	URM3120	Population, Urbanization and Sustainable Development
GRMD3404	Natural Hazards and Human Responses	URM4110	Urban Security and Risk Management
GRMD4502	Urban Big Data Analysis and Application	URM4020	Urban Data and Informatics
GRMD4503	Smart City Policies and Governance	URM4010	Smart Cities and Management
MAEG3060	Introduction to Robotics	ECE3060	Introduction to Robotics
MAEG3080	Fundamentals of Machine Intelligence	DDA3020	Machine Learning
MAEG3080	Fundamentals of Machine Intelligence	ECE4010	Machine Intelligence and Applications
MAEG4070	Engineering Optimization	MAT3007	Optimization
MATH2010	Advanced Calculus I	MAT1002	Calculus II
MATH3270	Ordinary Differential Equations	MAT2001	Honours Ordinary Differential Equations
PHYS1122	University Physics II – Introduction to Optics and Modern Physics	PHY2020	Principles of Physics III (Optics and Modern Physics)

PHYS1712	Physics Laboratory I	PHY1910	Physics Laboratory I
PHYS2041	University Physics III – Introduction to Heat and Electromagnetism	PHY1010	Principles of Physics II (Thermodynamics and EM)
PHYS2051	Quantitative Methods for Basic Physics	MAT1002	Calculus II
PHYS2061	Basic Computational Physics	PHY2650	Computational Physics I
PHYS3011	Classical Mechanics I	PHY3110	Classical Mechanics I
PHYS3021	Quantum Mechanics I	PHY3410	Quantum Mechanics and its Applications I
PHYS3022	Applied Quantum Mechanics	PHY3420	Quantum Mechanics and its Applications II
PHYS3031	Thermodynamics and Statistical Physics	PHY2002	Thermodynamics
PHYS3041	Electromagnetic Theory I	PHY3002	Electrodynamics I
PHYS3041	Electromagnetic Theory I	PHY3310	Electromagnetic Theory I
PHYS3051	Methods in Theoretical Physics I	PHY2610	Mathematical Methods in Physics I
PHYS3061	Introduction to Computer Simulation of Physical Systems	PHY3650	Computer Simulation of Physical Systems
PHYS3410	Practical Electronics	PHY3950	Basic Electronics
PHYS3730	Basic Instrumentation	PHY3960	Basic Instrumentation
PHYS4031	Statistical Mechanics	PHY4510	Statistical Mechanics and its Applications
PHYS4041	Electromagnetic Theory II	PHY3320	Electromagnetic Theory II
PHYS4041	Electromagnetic Theory II	PHY4002	Electrodynamics II
PHYS4050	Solid State Physics	PHY4001	Solid-State Physics
PHYS4430	Astrophysics	PHY3820	Introduction to Astronomy and Astrophysics
PHYS4450	Optical Physics	PHY3810	Modern Optical Physics
STAT2001	Basic Concepts in Statistics and Probability I	STA2001	Probability and Statistics I
URSP2100	Urban Sustainability	URM3010	Urban Sustainability

2ⁿᵈ Major: Energy and Environmental Engineering (offered by CUHK)

Courses offered by CUHK		Courses offered by CUHK(SZ)	
EEEN2020	Renewable Energy Technologies	ENE4005	Energy Resources and the Environment
EEEN2030	Energy and Environmental Economics and Management	ENE4007	Energy Economics
EEEN3030	Engineering Materials	ENE3006	Materials for Energy Applications
EEEN4060	Energy Distribution	ENE4011	Smart Grid
ELEG2202	Fundamentals of Electric Circuits	ECE2001	Basic Circuit Theory
ELEG3207	Introduction to Power Electronics	ENE4008	Power Electronics

ENGG1130	Multivariable Calculus for Engineers	MAT1002	Calculus II
MAEG2030	Thermodynamics	PHY2002	Thermodynamics
MAEG3030	Fluid Mechanics	PHY2010	Fluid Mechanics
MAEG4030	Heat Transfer	ENE3003	Heat and Mass Transfer for Energy Systems

2nd Major: Mechanical and Automation Engineering (offered by CUHK)

Courses offered by CUHK		Courses offered by CUHK(SZ)	
EEEN3030	Engineering Materials	ENE3006	Materials for Energy Applications
ELEG2202	Fundamentals of Electric Circuits	ECE2001	Basic Circuit Theory
ENGG1130	Multivariable Calculus for Engineers	MAT1002	Calculus II
MAEG2030	Thermodynamics	PHY2002	Thermodynamics
MAEG3030	Fluid Mechanics	PHY2010	Fluid Mechanics
MAEG3050	Introduction to Control Systems	EIE/ECE3250	System & Control
MAEG4030	Heat Transfer	ENE3003	Heat and Mass Transfer for Energy Systems

2nd Major: Earth and Environmental Sciences (offered by CUHK)

Courses offered by CUHK		Courses offered by CUHK(SZ)	
CSCI3320	Fundamentals of Machine Learning	DDA3020	Machine Learning
EESC3800	Global Environmental Change	GLB3060	Global Change and Environmental Sustainability
ELEG3503	Introduction to Digital Signal Processing	ECE3510	Digital Signal Processing

2nd Major: Physics (offered by CUHK)

Courses offered by CUHK		Courses offered by CUHK(SZ)	
PHYS1122	University Physics II – Introduction to Optics and Modern Physics	PHY2020	Principles of Physics III (Optics and Modern Physics)
PHYS1712	Physics Laboratory I	PHY1910	Physics Laboratory I
PHYS2041	University Physics III – Introduction to Heat and Electromagnetism	PHY1010	Principles of Physics II (Thermodynamics and EM)
PHYS2051	Quantitative Methods for Basic Physics	MAT1002	Calculus II
PHYS2061	Basic Computational Physics	PHY2650	Computational Physics I
PHYS3011	Classical Mechanics I	PHY3110	Classical Mechanics I

PHYS3021	Quantum Mechanics I	PHY3410	Quantum Mechanics and its Applications I
PHYS3022	Applied Quantum Mechanics	PHY3420	Quantum Mechanics and its Applications II
PHYS3031	Thermodynamics and Statistical Physics	PHY2002	Thermodynamics
PHYS3041	Electromagnetic Theory I	PHY3002	Electrodynamics I
PHYS3041	Electromagnetic Theory I	PHY3310	Electromagnetic Theory I
PHYS3051	Methods in Theoretical Physics I	PHY2610	Mathematical Methods in Physics I
PHYS3061	Introduction to Computer Simulation of Physical Systems	PHY3650	Computer Simulation of Physical Systems
PHYS3410	Practical Electronics	PHY3950	Basic Electronics
PHYS4011	Classical Mechanics II	PHY3120	Classical Mechanics II
PHYS4031	Statistical Mechanics	PHY4510	Statistical Mechanics and its Applications
PHYS4041	Electromagnetic Theory II	PHY3320	Electromagnetic Theory II
PHYS4041	Electromagnetic Theory II	PHY4002	Electrodynamics II
PHYS4050	Solid State Physics	PHY4001	Solid-State Physics
PHYS4430	Astrophysics	PHY3820	Introduction to Astronomy and Astrophysics
PHYS4450	Optical Physics	PHY3810	Modern Optical Physics
PHYS4460	Relativity	PHY4810	Relativity
PHYS4610	Senior Project I	PHY4270	Senior Project I

2nd Major: Geography and Resource Management (offered by CUHK)

Courses offered by CUHK		Courses offered by CUHK(SZ)	
GRMD2102	Fundamental Statistics for Geographers	URM2030	Statistical Analysis and Application
GRMD2303	Urban Geography	URM3130	Globalization and Cities
GRMD2401	Sustainable Development	URM3010	Urban Sustainability
GRMD3102	Research Design and Methodology	URM3020	Research Methods for Urban Studies
GRMD3203	Urban Environmental Problems	URM3030	Urban Environmental Management and Policy
GRMD3302	Population and Migration	URM3120	Population, Urbanization and Sustainable Development
GRMD3305	Transport Geography	URM4130	Urban Transportation System
GRMD3323	Urban and Regional Planning	URM3040	Urban and Regional Planning
GRMD3404	Natural Hazards and Human Responses	URM4110	Urban Security and Risk Management

GRMD4502	Urban Big Data Analysis and Application	URM4020	Urban Data and Informatics
GRMD4503	Smart City Policies and Governance	URM4010	Smart Cities and Management

2nd Major: Data Science and Big Data Technology (offered by CUHK(SZ))

Courses offered by CUHK(SZ)		Courses offered by CUHK	
CSC3100	Data Structures	CSCI2100	Data Structures
CSC3170	Database System	CSCI3170	Introduction to Database Systems
CSC4120	Design and Analysis of Algorithms	CSCI3160	Design and Analysis of Algorithms
DDA3005	Numerical Methods	EESC4520	Numerical Methods and Modeling for Earth and Environmental Sciences
DDA3020	Machine Learning	MAEG3080	Fundamentals of Machine Intelligence
MAT1002	Calculus II	MATH2010	Advanced Calculus I
MAT3007	Optimization	MAEG4070	Engineering Optimization
STA2001	Probability and Statistics I	STAT2001	Basic Concepts in Statistics and Probability I
STA2002	Probability and Statistics II	STAT2006	Basic Concepts in Statistics and Probability II
STA3020	Statistical Inference	EESC4510	Statistical Methods and Data Analysis for Earth and Environmental Sciences
STA4001	Stochastic Processes	MATH4240	Stochastic Processes
STA4001	Stochastic Processes	STAT3007	Introduction to Stochastic Processes

2nd Major: Urban Management (offered by CUHK(SZ))

Courses offered by CUHK(SZ)		Courses offered by CUHK	
URM2020	Urban Economics	URSP2200	Urban Economic Studies
URM2030	Statistical Analysis and Application	GRMD2102	Fundamental Statistics for Geographers
URM3010	Urban Sustainability	URSP2100	Urban Sustainability
URM3020	Research Methods for Urban Studies	GRMD3102	Research Design and Methodology
URM3030	Urban Environmental Management and Policy	GRMD3203	Urban Environmental Problems
URM3040	Urban and Regional Planning	GRMD3323	Urban and Regional Planning
URM3050	Urban Form, Design and Place Making	URSP2800	Urban Form, Sense of Place and Well-Being
URM3110	Urban History and Culture	URSP2030	Urban Cultures
URM3120	Population, Urbanization and Sustainable Development	GRMD3302	Population and Migration (alternative year)

URM3130	Globalization and Cities	GRMD2303	Urban Geography
URM3130	Globalization and Cities	URSP2400	Studies of Cities in Comparative Perspective
URM4010	Smart Cities and Management	GRMD4503	Smart City Policies and Governance
URM4020	Urban Data and Informatics	GRMD4502	Urban Big Data Analysis and Application
URM4110	Urban Security and Risk Management	GRMD3404	Natural Hazards and Human Responses
URM4120	Urban Housing and Land Market	URSP3100	Housing Issues and Policy
URM4130	Urban Transportation System	URSP3300	Sustainable Urban Transport
URM4150	Urban Spatial Analysis and Modeling	GRMD3106	Advanced GIS

2nd Major: Electrical and Computer Engineering (offered by CUHK(SZ))

Courses offered by CUHK(SZ)		Courses offered by CUHK	
CSC3100	Data Structures	CSCI2100	Data Structures
CSC3180	Fundamentals of Artificial Intelligence	CSCI3230	Fundamentals of Artificial Intelligence
DDA3020	Machine Learning	CSCI3320	Fundamentals of Machine Learning
ECE3001	Signal and Systems	IERG2051	Signal and Systems
ECE3050	Principles of Communication Systems	IERG2310	Principles of Communication Systems
ECE4016	Computer Networks	IERG3310	Computer Networks
ECE4300	Systems Design in Human-Computer Interaction	IERG3320	Social Media and Human Information Interaction
ERG4902	Capstone Project II	IERG4998	Final Year Project I
ERG4902	Capstone Project II	IERG4999	Final Year Project II
MAT1002	Calculus II	MATH2010	Advanced Calculus I
MAT4220	Partial Differential Equations	MATH4220	Partial Differential Equations
STA2001	Probability and Statistics I	STAT2001	Basic Concepts in Statistics and Probability I

2nd Major: New Energy Science and Engineering (offered by CUHK(SZ))

Courses offered by CUHK(SZ)		Courses offered by CUHK	
CSC3002	C/C++ Programming	CSCI1120	Introduction to Computing Using C++
CSC3150	Operating System	CSCI3150	Introduction to Operating Systems
DDA3020	Machine Learning	CSCI3320	Fundamentals of Machine Learning
ECE2001	Basic Circuit Theory	ELEG2202	Fundamentals of Electric Circuits

ENE3004	Design of Solar Energy Conversion Systems	EEEN4020	Solar Energy and Photovoltaic Technology
ENE3005	Electrochemical Energy Conversion	EEEN4050	Energy Storage Devices and Systems
ENE3050	Electrical Power Systems	ELEG3601	Introduction to Electric Power Systems
ENE4005	Energy Resources and the Environment	EEEN2020	Renewable Energy Technologies
ENE4007	Energy Economics	EEEN2030	Energy and Environmental Economics and Management
ENE4008	Power Electronics	ELEG3207	Introduction to Power Electronics
ENE4011	Smart Grid	EEEN4060	Energy Distribution
ERG4902	Capstone Project II	EEEN4998	Final Year Project I
PHY1910	Physics Laboratory I	PHYS1712	Physics Laboratory I

2nd Major: Physics (offered by CUHK(SZ))

Courses offered by CUHK(SZ)		Courses offered by CUHK	
MAT1002	Calculus II	MATH2010	Advanced Calculus I
MAT1002	Calculus II	PHYS2051	Quantitative Methods for Basic Physics
MAT2001	Honours Ordinary Differential Equations	MATH3270	Ordinary Differential Equations
PHY1010	Principles of Physics II (Thermodynamics and EM)	PHYS2041	University Physics III – Introduction to Heat and Electromagnetism
PHY1210	Student Oriented Learning I	PHYS2510	Student Centred Learning I
PHY1910	Physics Laboratory I	PHYS1712	Physics Laboratory I
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 I	PHYS2061	Basic Computational Physics
PHY3002	Electrodynamics I	PHYS3041	Electromagnetic Theory I
PHY3110	Classical Mechanics I	PHYS3011	Classical Mechanics I
PHY3120	Classical Mechanics II	PHYS4011	Classical Mechanics II
PHY3210	Experimental Physics Project Experience I	PHYS2610	Short Project I
PHY3230	Theoretical Physics Project Experience I	PHYS2610	Short 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

PHY3420	Quantum Mechanics and its Applications II	PHYS3022	Applied Quantum Mechanics
PHY3650	Computer Simulation of Physical Systems	PHYS3061	Introduction to Computer Simulation of Physical Systems
PHY3810	Modern Optical Physics	PHYS4450	Optical Physics
PHY3820	Introduction to Astronomy and Astrophysics	PHYS4430	Astrophysics
PHY3950	Basic Electronics	PHYS3410	Practical Electronics
PHY3960	Basic Instrumentation	PHYS3730	Basic Instrumentation
PHY4001	Solid-State Physics	PHYS4050	Solid State Physics
PHY4002	Electrodynamics II	PHYS4041	Electromagnetic Theory II
PHY4240	Seminar I	PHYS4801	Seminar I
PHY4510	Statistical Mechanics and its Applications	PHYS4031	Statistical Mechanics
PHY4810	Relativity	PHYS4460	Relativity
STA2001	Probability and Statistics I	STAT2001	Basic Concepts in Statistics and Probability I