THE CHINESE UNIVERSITY OF HONG KONG
DEPARTMENT OF INFORMATION ENGINEERING

**BSc in Mathematics and Information Engineering**
**Suggested Study Plans for MIEG Students Admitted in 2025-26**

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## A) Applicable for MIEG students admitted to the programme directly

### 1) An Overview

| UNIVERSITY CORE SUBJECTS | | Units |
|---|---|---|
| Chinese Language | | 5 |
| English Language | | 8 |
| General Education | University GE: Foundation Courses (6 units)<br>University GE: Four Areas (7 units)<br>College GE (6 units) | 19 |
| UGCP1001 Understanding China | | 1 |
| UGCP1002 Hong Kong in the Wider Constitutional Order | | 1 |
| ENGG1003 Digital Literacy and Computational Thinking | | 3 |
| Physical Education | | 2 |
| | Sub-Total | **39** |

| MIEG Major Requirements | | |
|---|---|---|
| Faculty Package | | 9 |
| Foundation Courses | | 9 |
| IE Required | | 30 |
| MATH Required | (MATH1090/1098, 2010/2018, 2020/2028, 2040/2048, 2050/2058, 2060/2068, 2070/2078, 2230) | 24 |
| Major Electives | | 9 |
| Final Year Project | | 6 |
| | Sub-Total | **87** |
| | **Minimum Graduation Requirement** | **126** |

### 2) A Suggested Study Plan

| | | Recommended Course Pattern | Units |
|---|---|---|---|
| **THE FIRST YEAR** | **Term 1** | Faculty Package: ENGG1110/ESTR1002 | 3 |
| | | Foundation Math: MATH1010/1018 | 3 |
| | | Language: CHLT1001 | 3 |
| | | Physical Education: 1 course | 1 |
| | | College General Education: 1 course | 3 |
| | | ENGG1003 | 3 |
| | | *Term total* | **16** |
| | **Term 2** | Faculty Package: MATH1025/1028, MATH1030/1038 | 6 |
| | | Foundation Science: Any one from AIST1110, CSCI1120/ESTR1100, CSCI1130/ESTR1102, IERG1080 | 3 |
| | | Language: ELTU1001 | 3 |
| | | Physical Education: 1 course | 1 |
| | | General Education: Foundation (1 course) | 3 |
| | | *Term total* | **16** |

| | | Recommended Course Pattern | Units |
|---|---|---|---|
| THE SECOND YEAR | **Term 3** | Major Required:<br>IERG2060/ESTR2304<br>IERG2820<br>MATH1090/1098<br>MATH2010/2018<br>MIEG2051/ESTR2360<br>Language: CHLT1002<br>General Education: Foundation (1 course) | <br>3<br>1<br>3<br>3<br>3<br>2<br>3 |
| | | *Term total* | **18** |
| | **Term 4** | Foundation Science: Any one from ENGG1310, PHYS1001 or 1002 or 1111, STAT1011<br>Major Required:<br>IERG2080/ESTR2306<br>MATH2020/2028<br>MIEG2440/ESTR2362<br>Major Elective(s): 1 course<br>Language: ELTU2014 | 3<br><br>3<br>3<br>3<br>3<br>3 |
| | | *Term total* | **18** |
| THE THIRD YEAR | **Term 5** | Major Required:<br>CSCI2100/ESTR2102<br>MATH2050/2058<br>MATH2230 (or MATH2040/2048)<br>Major Elective(s): 1 course<br>General Education: (2 courses) (Area A/C/D) | <br>3<br>3<br>3<br>3<br>5-6 |
| | | *Term total* | **17-18** |
| | **Term 6** | Major Required:<br>IERG2310/ESTR2300<br>IERG3310/ESTR3310<br>IERG3820<br>MATH2040/2048 (or MATH2230)<br>MATH2060/2068 (or MATH2070/2078)<br>Language: ELTU3014 | <br>3<br>3<br>1<br>3<br>3<br>2 |
| | | *Term total* | **15** |
| THE FOURTH YEAR | **Term 7** | Major Required:<br>CSCI3160/ESTR3104<br>IERG3080/ESTR3308<br>IERG3800<br>IERG4998/ESTR4998<br>0-1 course from MATH2070/2078 (or 2060/2068)<br>College General Education: 1 course<br>General Education: Understanding China | <br>3<br>3<br>1<br>3<br>0-3<br>3<br>1 |
| | | *Term total* | **14-17** |
| | **Term 8** | Major Required:<br>IERG4999/ESTR4999<br>0-1 course from MATH2070/2078 (or 2060/2068)<br>Major Elective(s): 2 courses<br>General Education: (1 course) (Area A/C/D)<br>General Education: Hong Kong in the Wider Constitutional Order | <br>3<br>0-3<br>6<br>2-3<br>1 |
| | | *Term total* | **12-16** |
| | | **Minimum Graduation Requirement:** | **126** |

## B) Applicable for MIEG students admitted via the Faculty of Science (under the Mathematics Enrichment Stream)

### 1) An Overview

| UNIVERSITY CORE SUBJECTS | | Units |
|---|---|---|
| Chinese Language | | 5 |
| English Language | | 8 |
| General Education | University GE: Foundation Courses (6 units)<br>University GE: Four Areas (7 units)<br>College GE (6 units) | 19 |
| UGCP1001 Understanding China | | 1 |
| UGCP1002 Hong Kong in the Wider Constitutional Order | | 1 |
| ENGG1003 Digital Literacy and Computational Thinking (ENGG1003) | | 3 |
| Physical Education | | 2 |
| | Sub-Total | **39** |

| MIEG Major Requirements | | |
|---|---|---|
| Faculty Package | | 9 |
| Foundation Courses | | 9 |
| IE Required | | 33 |
| MATH Required | (MATH1090/1098, 2010/2018, 2020/2028, 2040/2048, 2050/2058, 2060/2068, 2070/2078, 2230) | 24 |
| Major Electives | | 6 |
| Final Year Project | | 6 |
| | Sub-Total | **87** |
| | **Minimum Graduation Requirement** | **126** |

### 2) A Suggested Study Plan

| | | Recommended Course Pattern | Units |
|---|---|---|---|
| **THE FIRST YEAR** | **Term 1** | Faculty Package: MATH1010/1018, STAT1011<br>Major Required: MATH1025/1028<br>Language: CHLT1001<br>Physical Education: 1 course<br>College General Education: 1 course<br>ENGG1003 | 6<br>3<br>3<br>1<br>3<br>3 |
| | | *Term total* | **19** |
| | **Term 2** | Faculty Package: A course from Science Faculty Package Group A, B or D<br>Foundation Math: MATH1030/1038, MATH1090/1098<br>Language: ELTU1001<br>Physical Education: 1 course<br>General Education: Foundation (1 course) | 3<br>6<br>3<br>1<br>3 |
| | | *Term total* | **16** |

| | | Recommended Course Pattern | Units |
|---|---|---|---|
| THE SECOND YEAR | **Term 3** | Foundation Science: ENGG1110/ESTR1002 | 3 |
| | | Major Required: | |
| | | IERG2060/ESTR2304 | 3 |
| | | IERG2820 | 1 |
| | | MATH2010/2018 | 3 |
| | | MATH2040/2048 | 3 |
| | | MIEG2051/ESTR2360 | 3 |
| | | Language: CHLT1002 | 2 |
| | | *Term total* | **18** |
| | **Term 4** | Foundation Science: Any one from AIST1110, CSCI1120/ESTR1100, CSCI1130/ESTR1102, IERG1080 | 3 |
| | | Major Required: | |
| | | IERG2080/ESTR2306 | 3 |
| | | MATH2020/2028 | 3 |
| | | MIEG2440/ESTR2362 | 3 |
| | | Language: ELTU2014 | 3 |
| | | General Education: Foundation (1 course) | 3 |
| | | *Term total* | **18** |
| THE THIRD YEAR | **Term 5** | Major Required: | |
| | | CSCI2100/ESTR2102 | 3 |
| | | MATH2050/2058 | 3 |
| | | MATH2230 (or 2070/2078) | 3 |
| | | College General Education: 1 course | 3 |
| | | General Education: (1 course) (Area A/C/D) | 3 |
| | | *Term total* | **15** |
| | **Term 6** | Major Required: | |
| | | IERG2310/ESTR2300 | 3 |
| | | IERG3310/ESTR3310 | 3 |
| | | IERG3820 | 1 |
| | | MATH2060/2068 | 3 |
| | | MATH2070/2078 | 3 |
| | | Language: ELTU3014 | 2 |
| | | *Term total* | **15** |
| THE FOURTH YEAR | **Term 7** | Major Required: | |
| | | CSCI3160/ESTR3104 | 3 |
| | | IERG3080/ESTR3308 | 3 |
| | | IERG3800 | 1 |
| | | IERG4998/ESTR4998 | 3 |
| | | Major Elective(s): 1 course | 3 |
| | | General Education: (1 course) (Area A/C/D) | 2-3 |
| | | General Education: Understanding China | 1 |
| | | *Term total* | **16-17** |
| | **Term 8** | Major Required: | |
| | | IERG4999/ESTR4999 | 3 |
| | | Major Elective(s): 1 course | 3 |
| | | General Education: (1 course) (Area A/C/D) | 2-3 |
| | | General Education: Hong Kong in the Wider Constitutional Order | 1 |
| | | *Term total* | **9-10** |
| | | **Minimum Graduation Requirement:** | **126** |

## Course List

*(Note: For quick reference of the courses appeared on the study plan(s).*
*Please refer to CUSIS for course information)*

| *Course Code* | *Course Title* | *Unit(s)* |
|---|---|---|
| AIST1110 | Introduction to Computing using Python | 3 |
| CHLT1001 | University Chinese I | 3 |
| CHLT1002 | University Chinese II | 2 |
| CSCI1120/ESTR1100 | Introduction to Computing Using C++ | 3 |
| CSCI1130/ESTR1102 | Introduction to Computing Using Java | 3 |
| CSCI2100/ESTR2102 | Data Structures | 3 |
| CSCI3130 | Formal Languages and Automata Theory | 3 |
| CSCI3150/ESTR3102 | Introduction to Operating Systems | 3 |
| CSCI3160/ESTR3104 | Design and Analysis of Algorithms | 3 |
| CSCI3230/ESTR3108 | Fundamentals of Artificial Intelligence | 3 |
| CSCI3320 | Fundamentals of Machine Learning | 3 |
| ELTU1001 | Foundation English for University Studies | 3 |
| ELTU2014 | English for Engineering I | 3 |
| ELTU3014 | English for Engineering II | 2 |
| ENGG1110/ESTR1002 | Problem Solving by Programming | 3 |
| ENGG1120/ESTR1005 | Linear Algebra for Engineers | 3 |
| ENGG1130/ESTR1006 | Multivariable Calculus for Engineers | 3 |
| ENGG1310/ESTR1003 | Engineering Physics: Electromagnetics, Optics and Modern Physics | 3 |
| ENGG1820 | Engineering Internship | 1 |
| ENGG5501 | Foundations of Optimization | 3 |
| IERG1080 | Introduction to Python for Engineering Applications | 3 |
| IERG2060/ESTR2304 | Basic Analog and Digital Circuits | 3 |
| IERG2080/ESTR2306 | Introduction to Systems Programming | 3 |
| IERG2310/ESTR2300 | Principles of Communication Systems | 3 |
| IERG2820 | Electronic Circuit Design Laboratory | 1 |
| IERG3010/ESTR3300 | Digital Communications | 3 |
| IERG3050 | Simulation and Statistical Analysis | 3 |
| IERG3060 | Microcontrollers and Embedded Systems | 3 |
| IERG3080/ESTR3308 | Information and Software Engineering Practice | 3 |
| IERG3280/ESTR3302 | Networks: Technology, Economics, and Social Interactions | 3 |
| IERG3300/ESTR3304 | Introduction to Stochastic Processes | 3 |
| IERG3310/ESTR3310 | Computer Networks | 3 |
| IERG3320/ESTR3306 | Social Media and Human Information Interaction | 3 |
| IERG3800 | Information Infrastructure Design Lab | 1 |
| IERG3810 | Microcontrollers and Embedded System Laboratory | 1 |
| IERG3820 | Communications Laboratory | 1 |
| IERG3830 | Product Design and Development | 3 |
| IERG4004 | E-payment Systems and Cryptocurrency Technologies | 3 |
| IERG4030/ESTR4320 | Optical Communications | 3 |
| IERG4060 | Real-time Embedded Systems | 3 |
| IERG4080/ESTR4312 | Building Scalable Internet-based Services | 3 |
| IERG4090/ESTR4302 | Networking Protocols and Systems | 3 |

| *Course Code* | *Course Title* | *Unit(s)* |
|---|---|---|
| IERG4100/ESTR4304 | Wireless Communication Systems | 3 |
| IERG4110/ESTR4314 | Hands-on Wireless Communication | 3 |
| IERG4120/ESTR4328 | Functional Programming | 3 |
| IERG4130/ESTR4306 | Introduction to Cyber Security | 3 |
| IERG4150/ESTR4322 | Introduction to Cryptography | 3 |
| IERG4160 | Image Processing and Visual Understanding | 3 |
| IERG4180/ESTR4308 | Network Software Design and Programming | 3 |
| IERG4190 | Multimedia Coding and Processing | 3 |
| IERG4210 | Web Programming and Security | 3 |
| IERG4220 | Secure Software Engineering | 3 |
| IERG4230 | Introduction to Internet of Things | 3 |
| IERG4240 | Positioning Principles and Technologies | 3 |
| IERG4300/ESTR4300 | Web-scale Information Analytics | 3 |
| IERG4320/ESTR4324 | Data Science in Practice | 3 |
| IERG4330/ESTR4316 | Programming Big Data Systems | 3 |
| IERG4340 | Emerging Technologies in Information Engineering | 3 |
| IERG4350 | Cloud Computing Security | 3 |
| IERG4360/ESTR4326 | Blockchain and Applications | 3 |
| IERG4831 | Networking Laboratory I | 2 |
| IERG4841 | Networking Laboratory II | 2 |
| IERG4851 | Cyber Security Laboratory | 1 |
| IERG4998/ESTR4998 | Final Year Project I | 3 |
| IERG4999/ESTR4999 | Final Year Project II | 3 |
| IERG5020 | Telecommunication Switching and Network Systems | 3 |
| IERG5040/ENGG5383 | Lightwave System Technologies | 3 |
| IERG5050 | AI Foundation Models, Systems and Applications | 3 |
| IERG5090 | Advanced Networking Protocols and Systems | 3 |
| IERG5100/ENGG5303 | Advanced Wireless Communications | 3 |
| IERG5110 | Signal Processing in Wireless Communications and Sensing | 3 |
| IERG5130 | Probabilistic Models and Inference Algorithms for Machine Learning | 3 |
| IERG5140 | Lightwave Networks | 3 |
| IERG5154/ENGG5301 | Information Theory | 3 |
| IERG5200 | Channel Coding and Modulation | 3 |
| IERG5230 | Algorithms and Realization of Internet of Things Systems | 3 |
| IERG5240/ENGG5383 | Applied Cryptography | 3 |
| IERG5250 | Edge AI and Applications | 3 |
| IERG5254 | Network Information Theory | 3 |
| IERG5280 | Wireless and Mobile Networking | 3 |
| IERG5290 | Network Coding Theory | 3 |
| IERG5300/ENGG5302 | Random Processes | 3 |
| IERG5310 | Security and Privacy in Cyber Systems | 3 |
| IERG5320 | Digital Forensics | 3 |
| IERG5330 | Network Economics | 3 |
| IERG5340 | IT Innovation and Entrepreneurship | 3 |
| IERG5350 | Reinforcement Learning | 3 |
| IERG5360 | Program Representation, Modeling and Understanding for Software Security | 3 |

| *Course Code* | *Course Title* | *Unit(s)* |
|---|---|---|
| IERG5380 | Quantum Information Processing | 3 |
| IERG5400 | Theory of Probability | 3 |
| IERG5450 | AI for Science | 3 |
| IERG5460 | Multimodal Machine Learning | 3 |
| IERG5470 | Convex and Stochastic Optimization and Applications | 3 |
| IERG5590 | Advanced Topics in Blockchain | 3 |
| IERG5670 | Computational Imaging Systems and Algorithms | 3 |
| MATH1010 | University Mathematics | 3 |
| MATH1018 | Honours University Mathematics | 3 |
| MATH1020 | General Mathematics | 3 |
| MATH1025 | Essential Mathematical Methods | 3 |
| MATH1028 | Honours Essential Mathematical Methods | 3 |
| MATH1030 | Linear Algebra I | 3 |
| MATH1038 | Honours Linear Algebra I | 3 |
| MATH1090 | Introduction to Set Theory | 3 |
| MATH1098 | Honours Introduction to Set Theory | 3 |
| MATH2010 | Advanced Calculus I | 3 |
| MATH2018 | Honours Advanced Calculus I | 3 |
| MATH2020 | Advanced Calculus II | 3 |
| MATH2028 | Honours Advanced Calculus II | 3 |
| MATH2040 | Linear Algebra II | 3 |
| MATH2048 | Honours Linear Algebra II | 3 |
| MATH2050 | Mathematical Analysis I | 3 |
| MATH2058 | Honours Mathematical Analysis I | 3 |
| MATH2060 | Mathematical Analysis II | 3 |
| MATH2068 | Honours Mathematical Analysis II | 3 |
| MATH2070 | Algebraic Structures | 3 |
| MATH2078 | Honours Algebraic Structures | 3 |
| MATH2230 | Complex Variables with Applications | 3 |
| MATH3020 | Axiomatic Set Theory and Applications | 3 |
| MATH3030 | Abstract Algebra | 3 |
| MATH3040 | Fields and Galois Theory | 3 |
| MATH3060 | Mathematical Analysis III | 3 |
| MATH3070 | Introduction to Topology | 3 |
| MATH3080 | Number Theory | 3 |
| MATH3093 | Fourier Analysis | 3 |
| MATH3215 | Operations Research | 3 |
| MATH3230 | Numerical Analysis | 3 |
| MATH3250 | Discrete Mathematics | 3 |
| MATH3260 | Graph Theory | 3 |
| MATH3270 | Ordinary Differential Equations | 3 |
| MATH3290 | Mathematical Modeling | 3 |
| MATH3310 | Computational and Applied Math | 3 |
| MATH3320 | Foundation of Data Analytics | 3 |
| MATH3330 | Big Data Computing | 3 |
| MATH3340 | Mathematics of Machine Learning | 3 |
| MATH3360 | Mathematical Imaging | 3 |
| MATH4010 | Functional Analysis | 3 |
| MATH4020 | Calculus of Variations | 3 |

| *Course Code* | *Course Title* | *Unit(s)* |
|---|---|---|
| MATH4030 | Differential Geometry | 3 |
| MATH4230 | Optimization Theory | 3 |
| MATH4240 | Stochastic Processes | 3 |
| MATH4260 | Coding Theory and Cryptography | 3 |
| MATH4280 | Data Analytics in Design and Innovation | 3 |
| MIEG2051/ESTR2360 | Fourier Analysis with Engineering Applications | 3 |
| MIEG2440/ESTR2362 | Discrete Structures and Probability | 3 |
| PHYS1001 | Essential Physics | 3 |
| PHYS1002 | General Physics | 3 |
| PHYS1111 | Introduction to Mechanics, Fluids, and Waves (University Physics I) | 3 |
| STAT1011 | Introduction to Statistics | 3 |
| UGCP1001 | Understanding China | 1 |
| UGCP1002 | Hong Kong in the Wider Constitutional Order | 1 |
| UGFH1000 | In Dialogue with Humanity | 3 |
| UGFN1000 | In Dialogue with Nature | 3 |